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# Food Manufacture

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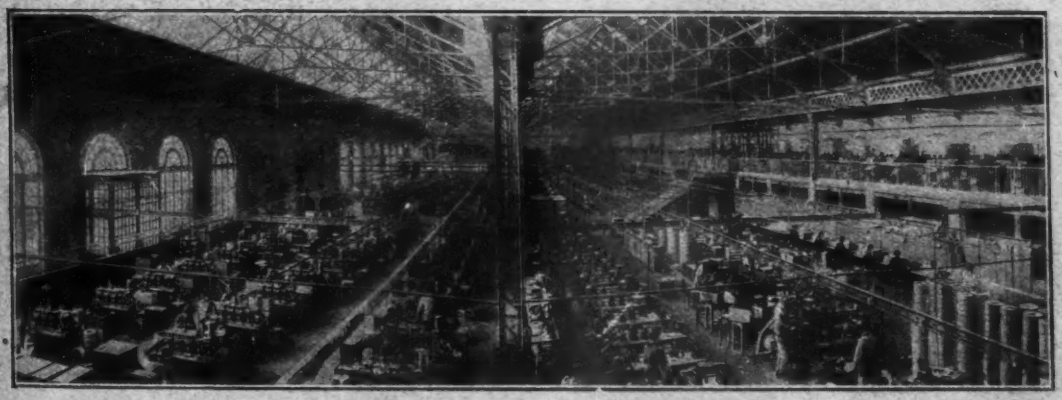

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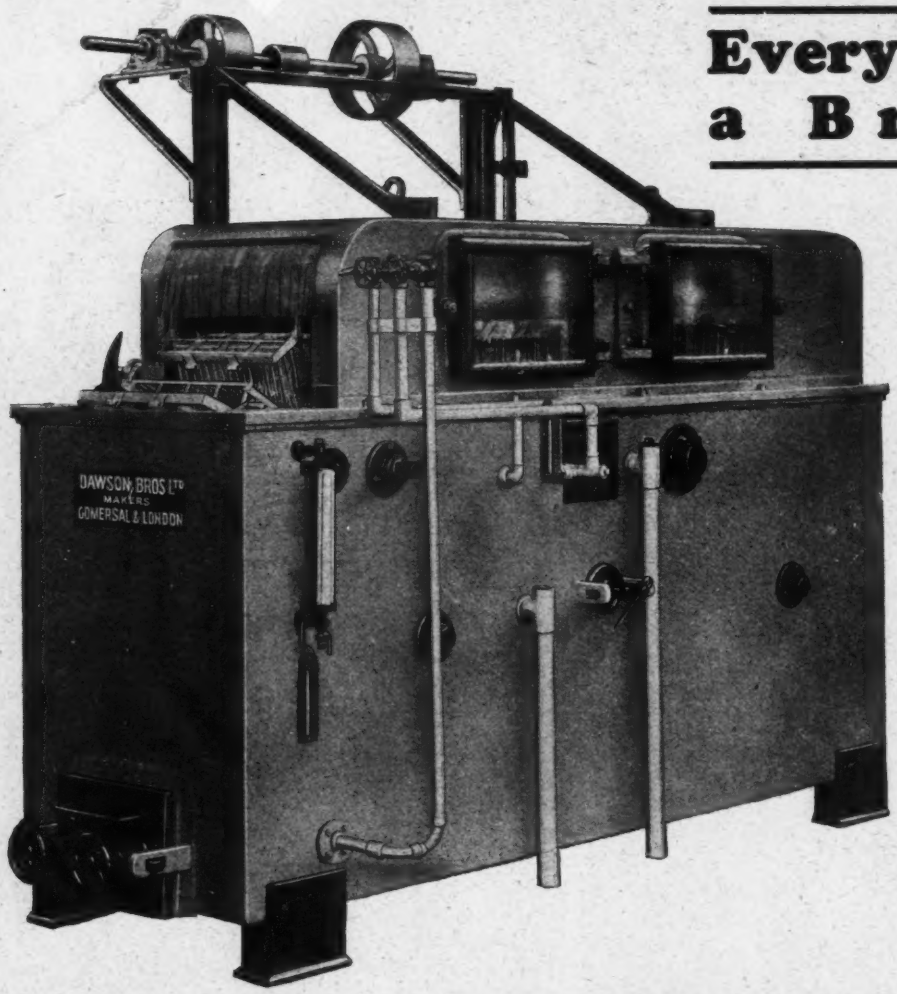


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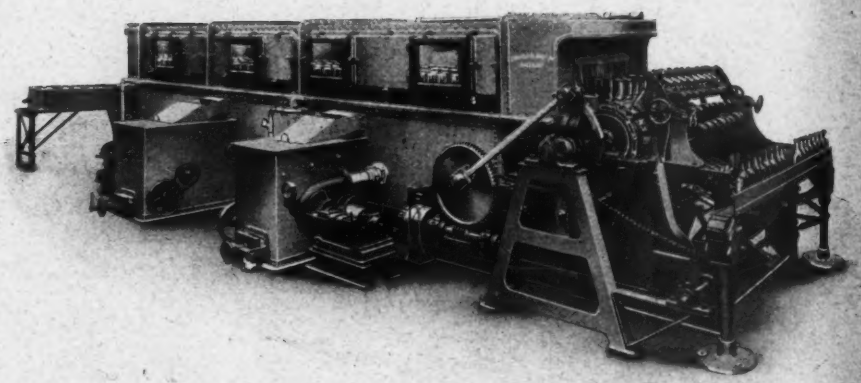

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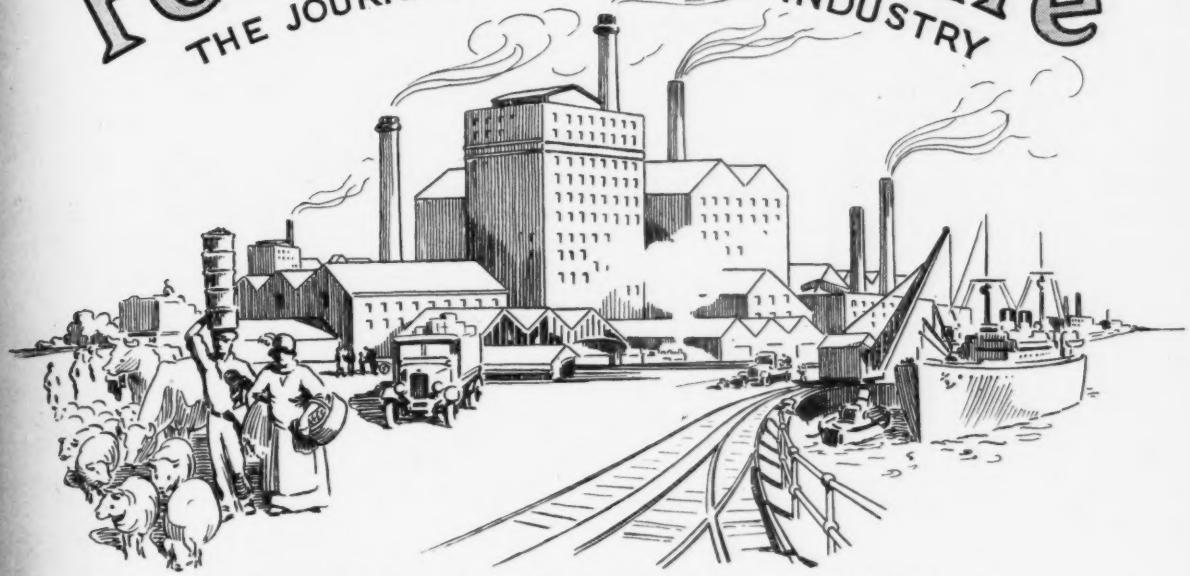

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***The editor will be glad to consider contributions from those engaged in the Food Industry. Articles intended for publication should be of a practical nature and accompanied by photographs or drawings whenever possible.***

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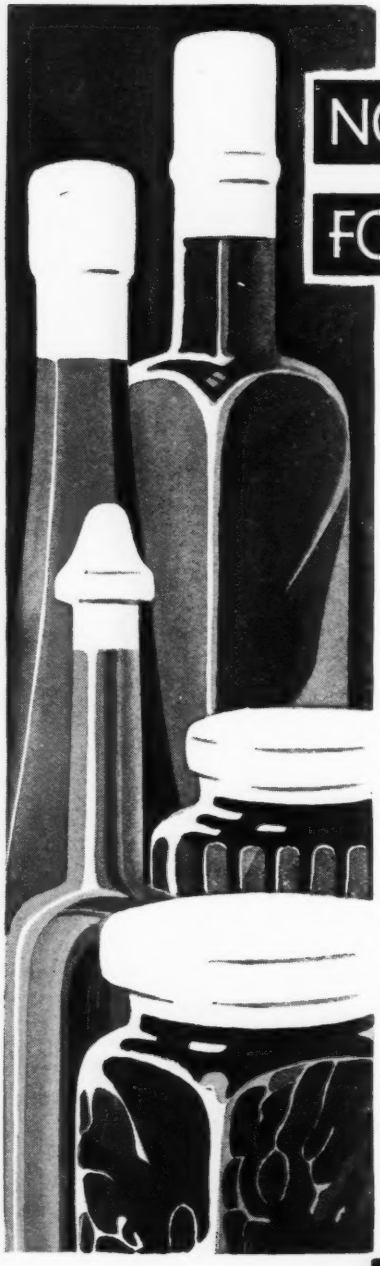

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# Food Manufacture

*The Journal of the Food Industry*

Vol. V. June, 1930 No. 6

### Russian Canning.

IT IS reported that the erection of fifty-five canning factories is part of the new development scheme which Russia is planning for the canning industry. The principal factories already in construction are situated in the Far East, Transcaucasia, Caucasia, and Crimea. Three plants have also been constructed at Leningrad, another at Astrakan, and still another at Nijni-Novgorod. It is reported that the other factories contemplated will be placed in activity before the end of 1933.

### South African Canning.

At a conference of canning interests recently called by the Department of Agriculture, South Africa, it was resolved to form a Council to promote the production, manufacture, and disposal of fruit and vegetable products. The Council's first activities will be devoted to collecting information, organising investigations, and advising as to the most suitable operations for various parts of South Africa. The Council will also take steps to secure the interest and co-operation of the Government in the development of the industry, and it will also, in suitable instances, interest growers and others in the establishment of local canning schemes. Evidently South Africa is following in the footsteps of the National Food Canning Council.

### The Canadian Budget.

There are several outstanding items of interest contained in the Budget Speech delivered on May 1 by the Dominion Minister of Finance in the House of Commons at Ottowa. It was announced that provision will be made in the Customs Tariff for the imposition of Countervailing Duties on butter, potatoes, soups, live stock, fresh meats, cured meats, eggs in shell, frozen eggs, oats, oatmeal, wheat, wheat flour, and rye. The tariff changes proposed involve, in the case of the British Preferential Tariff, increases in respect of 11 tariff items and decreases in respect of 270 tariff items. As the result of this revision, free entry into Canada under the British Preferential Tariff will be conceded in the case of 589 tariff items out of the 1,188 items which make up the Canadian Customs Tariff. Reductions in the "Preferential" rates are proposed on prepared vegetables, sauces, soups, and canned meats. Further particulars can be obtained from the High Commissioner for Canada.

### New Canadian Regulations.

After May 15, 1930, no jam, jelly, or marmalade shall be packed in containers of sizes other than those provided by the regulations established by Order-in-Council of May 29, 1929, according to the provisions of an Order-in-Council dated April 2, 1930.

### Pork and "Brawn."

According to official statistics, about a quarter of the German workman's expenditure on food is for meat and foodstuffs containing meat. It is calculated that sausages, bacon, ham, and such goods constitute 40 per cent. of these meat foodstuffs.

We can now understand how it is that the buffet at Leipzig railway station is able to sell on an average 60,000 brace of sausages a day, although *Punch* suggests that a large proportion is consumed by chain-eaters.

### Fish Conference.

For two days in January a conference of sea fishery officers was held by the Dominion Fisheries Branch at Halifax, Nova Scotia. R. H. Williams touched on several matters connected with the lobster canning industry, and A. H. Whitman discussed the trend of the salt fish trade. A number of papers were read.

### Antarctic Whaling.

Two of the largest "factory" ships of the Norwegian fleet, which has been operating in Antarctic waters during the summer months, have had a remarkably successful whaling season. One of them, the *Kosmos*, secured 1,820 whales and a cargo of 116,000 barrels of oil valued at more than £500,000. During operations, this factory ship lost its seaplane with two men while reconnoitring for whales, and also one of the chasers which was crushed while being towed through the ice floes.

### Sharks.

It is reported that a company is about to be registered to engage in a shark fishing industry to be located at Durban, South Africa. Fishing operations will be carried out in the Indian Ocean and Atlantic waters, and it is stated that the captured sharks will be manufactured into about twenty-one products, amongst which will be an oil extracted from the liver of the fish. The ingenuity of men is amazing! Two or three years ago we were told that elaborate researches had been carried out over here with a view to devising ways and means of turning the shark into saleable products.

### Sardines in Egypt.

It is somewhat surprising that British and American canners have not given Egypt more serious attention as a promising market for sardines. Portugal offers a cheap quality of sardines and in 1929 supplied 90 per cent. of the total consumption, which amounted to some £100,000 worth. The product is consumed in large quantities by the natives and the fellaheen. The outlet for high quality sardines among the Europeans and better class Egyptians is, however, small. Sardines are such a popular item that they are usually found in the smallest grocery stores.

### Pectin in Britain.

James Sommerville, Junr., has raised some interesting points regarding the pectin trade situation in this country. It appears that, so far, apple pectin has been the only pectin used in important quantities; the consumption of citrus pectin is quite small. It is stated that there is only one firm manufacturing the former, the principal source of supply being Germany. Importations from U.S.A. have fallen off in recent years. The opinion is expressed that there are definite possibilities for anyone setting out to develop a market for citrus pectin.

### "Fish and Ships."

On May 1, we received an interesting letter from a correspondent, who pointed out that the naval treaty had been signed and then asked the question—or, at least, two questions: "Why scrap ships?" "Why not adapt them?" We quite agree—but how? Our correspondent replies that they would provide excellent town sites—airy and healthy, with good facilities for washing, community cooking, and recreation—if they were settled in continuous chains or groups in harbours, rivers, etc., and connected by bridges. No doubt that is a fine idea, but we should prefer to have them free to move about; this, and any of their ammunition that might be left over, would make one feel fairly secure against tax collectors and the like. Another scheme would be to plant the quarter-decks with potatoes and turn the ship into a really live organisation for manufacturing fish and chips.

### Fig Canning.

The ease with which figs are cultivated in many parts of South Africa and the apparently successful introduction of canned figs on the British market by American packers has served to direct the attention of African fig growers to the possibilities of expansion along such lines. Relatively large quantities of fresh figs are being sold to established jam factories in the Union where they are made up into fig jam; this, however, is rather too sweet for the British palate.

### Almonds.

Almond production in the Provence region of France during 1929 is estimated at over seven million pounds, as compared with an average of thirteen million pounds a year during the period 1922-26. Large quantities of shelled almonds are imported from Spain, Italy, and Northern Africa. The soft and semi-soft shell varieties are usually marketed in the unshelled state, while the hard shelled grades are shelled at production centres and shipped directly to wholesalers, where they are soaked in boiling water, properly skinned and sorted by hand. The larger sizes of the shelled product are sold as salted or grilled almonds and the smaller varieties are converted into almond powder for use in the chocolate and confectionery industries. The finest grades of long, tapering almonds are used by confectioners.

The by-products obtained either from almonds or such substitutes as apricot and peach kernels include fatty almond or kernel oil from primary crushing processes, oil cake, and bitter almond oil obtained by distillation. The oil cakes are powdered and used in biscuit making. Among the substitutes for almond oil and paste may be mentioned the Indian almond oil from the *Terminalia Catappa* tree, Indian almonds or mahogany nuts, and benzoic aldehyde or mirbane oil.

### Can Sizes.

It is recommended by the Simplified Practice Division of the United States Bureau of Standards that the number of can sizes for packing and canning fruit and vegetables be reduced from 64 to 27. This recommendation is based on replies received from about 500 canners out of some 2,800 circularised in connection with the survey, which was undertaken at the request of the National Canners' Association. In practically every case the can recommended for elimination was used in less than 0·1 per cent. of the total annual pack.

### Pectin Jellies.

In the *Jour. Physical Chem.*, 1929, p. 1987, G. Spencer discusses the conditions governing the setting of pectin-sugar-acid mixtures to a jelly. In the "jelly field" of every fruit, there is a combination of sugar and acid concentrations for a jelly of whatever characteristics may be desired for practical purposes.

### Tomato Products.

A comprehensive report (*U.S. Tariff Commission*, Washington, D.C.) has been issued on the differences in production costs of canned tomatoes and other tomato products in the U.S., Italy, and other competing countries.

### Dates.

Most of the African dates enter France through the Port of Marseilles. The best varieties for export are Deglet Noor, Ghar, and Majhoul. The Deglet Noor is allowed to ripen fully on the tree before picking, is dried and then packed into 65 lb. boxes. Ghar and some other varieties when ripe are filled with a heavy syrup, which is pressed out before the fruit is packed as "loaf" dates; the syrup is known as "date honey." According to Zilisch, about 15 per cent. of a date is stone; the flesh contains from 60 to 75 per cent. of sugars, 2·0 per cent. ash, 0·3 per cent. fat, and 1·7 per cent. protein. After softening the stones by boiling, they may be used as food for camels and asses.

### Apples for Pies.

Mazzola (*F.I.*, 1930, p. 111) gives the following advantages of the canned apple for pies. Retention of freshlike tartness and aroma; bakes into tender pies at the proper temperature in 30 minutes; on account of the greater tartness, more sugar is necessary, producing the additional pie-filling very inexpensively; there is no deterioration of the canned fruit on standing from autumn until the following summer, whereas this is certainly not so with the fresh fruit in cold storage. Thus standardisation on the proper kind of canned apples will ensure uniform pies the year around. The cost of carrying canned apples is negligible as compared with carrying fresh fruit in storage. The volume of a can of apples remains constant during the storage period, while the fresh fruit shrinks in volume. When apples are canned in prime condition, there is no necessity for using acids in pie-making.

### Coffee Research.

The Mellon Institute of Industrial Research, University of Pittsburgh, continues to issue important reports of researches carried out under the scheme of industrial fellowship. We have received five papers compiled by Dr. R. R. Irvin relating to the hygienic aspects of coffee and to coffee, tea, and milk drinking among children.

Another interesting paper, by F. R. Harding, is "The Development of a New Ready-to-Serve Breakfast Food," and the same author is responsible for the "Properties and Uses of an Edible Rice Cellulose" and "Dietetic Investigations of Edible Pure Cellulose."

### Frozen-Pack Preservation.

The U.S. Department of Agriculture has recently issued Bulletin No. 148, which describes the frozen-pack method of preserving berries in the Pacific North-West. In this connection two other publications of approximately the same date may be mentioned. One is Farmers' Bulletin No. 1617 on "Soybean Utilisation" and the other is Bulletin No. 60 of the Hawaii Agricultural Experiment Station on the utilisation and composition of Oriental vegetables in Hawaii.

### Schools for Fishermen.

Under the direction of the Biological Board of Canada, courses of lectures and practical instruction have been put into operation for the benefit of fishermen. A new building for the purpose is being erected at the Atlantic Fisheries Experimental Station, Halifax. Amongst the numerous subjects for study and practice, one may instance fish handling, salting, freezing, drying, smoking, pickling, canning, bacteriology and spoilage, biology of fish, as well as banking, marketing and other commercial subjects. Canada appears to be well ahead of us in these matters.

### Cereal Convention.

The 16th Annual Convention of the American Association of Cereal Chemists was held from May 5 to 9 in Chicago. Numbers of useful papers were read; on the last day there was a symposium on the progress in the science of food products.

## Rice.

The cultivation and preparation of rice formed the subject of a paper read before the Royal Society of Arts on May 14 by C. E. Douglas. The author of this paper gave a mass of information on the distribution, production, cultivation, milling, and so forth, of this cereal. Few people are aware that there are five or six thousand botanical varieties of rice in the world. Although a considerable quantity of rice for export is finished in Eastern mills, large shipments are made of partially milled rice to other countries, where it is milled up and finished to suit local markets. There are mills in Hamburg, Holland, and many other places in Europe and America; at one time there were several mills in London and Liverpool, yet in spite of the fact that so much of the semi-milled rice is of Empire origin, we appear to be unable to compete with Dutch and German white rice mills.

Mr. Douglas suggested that there is room for improvement in selling methods; the presentation of suitably milled rice in simple, attractive cartons, and the launching of an advertising campaign would do much to make rice a popular article of diet.

## Empire Advertising.

In an American contemporary we read, "Will American food packers sit back and lose their export business to Britain and her colonies? How can the situation best be met? This is a subject for the food industry organisations to consider and discuss at their meetings."

This, of course, refers to the activities of the Empire Marketing Board's advertising campaign. "English State advertising is obviously going to be a very interesting and painful subject for the American exporter." Further: "We must admit that England has succeeded to a marked extent in showing that she can influence, not the amount, but the origin of her own imports by advertising. . . . England has been trying for about five years, in a methodical way, a new economic experiment in State advertising for increasing her diminishing trade."

We read that the effect of this campaign is being felt in Sacramento Valley and in other raisin producing areas in America. On the other hand, Australian grape growers were compelled to find additional capital to enlarge their output to meet a stimulated market. "This may well mark a dangerous precedent from the standpoint of American foreign trade."

## Food Handlers.

From time to time Medical Officers of Health in this country have mentioned the desirability of providing regular medical supervision of workers who handle foodstuffs. The question bristles with difficulties, but already there have been several interesting experiments on these lines in the United States. Fourteen years ago in New York a very complete medical examination of food handlers was attempted. This was probably too ambitious a scheme to be universally adopted. Another experiment was started in Kansas City about 1922. In this case it was confined to physical examination for certain contagious diseases.

The most interesting and instructive example of the medical examination of workers who handle foodstuffs is that of New Jersey, U.S.A., where over 80,000 examinations have been made in the City Clinics since 1920. The Public Health Officer of Newark, New Jersey, gives a valuable account of this work in a recent number of *Public Health*. The food handlers who are regularly examined include bakers, confection and candy makers, ice-cream makers, dairy workers, waiters, grocery assistants, etc. These workers are not allowed to obtain employment unless they have been accepted as suitable by the City Clinics. Moreover, each worker is re-examined every six months. The examinations are designed to detect those diseases which are most likely to be spread by means of food. In this way a high standard has been set up for the health of the food handler.

## Trade in Meat.

The recently issued report for 1929 by Mr. Millman, the Superintendent of the London Central Markets, is of considerable interest and draws particular attention to the influence of the embargo which was placed on Continental meat supplies in 1926. Comparing the London meat supply of 1929 with that of 1913, Mr. Millman shows decreases in home killed beef of 3,711 tons, Dominion beef 12,432 tons, Dominion mutton and lamb 9,599 tons, and foreign pork 23,720 tons. On the other hand, he records the following increases: foreign beef 30,832 tons, home killed pork, 20,800 tons, foreign mutton and lamb 8,438 tons, Dominion pork 2,806 tons, home killed mutton and lamb 2,513 tons.

During 1925 the Smithfield market alone handled 127,779 tons of freshly killed meat, of which the United Kingdom provided 74,446 tons; by 1929 this last figure had dropped 20,645 tons, in spite of the fact that an embargo had been in force since 1926.

There appears to be a tendency towards a decrease in the amount of home-bred produce arriving in the London markets and a corresponding increase in chilled beef and frozen mutton. Possibly this is due to the phenomenal advances made during the last few years in refrigeration and cold storage processes and in methods of transport.

# Table Jelly Manufacture

By H. G. WATTS, B.Sc., A.R.C.S., A.I.C.,
*Chief Chemist, Sunrise Preserving Company, Ltd.*

*The following is probably the only substantial article that has ever been published on the manufacture of table jelly under modern, scientific conditions.*

A WISE discrimination in the choice of raw materials is a matter of great importance in the manufacture of confectionery products; in the case of table jellies the choice of a suitable gelatin calls for very careful consideration.

On the assumption that the jelly strength of the jelly is to be derived exclusively from gelatin, it follows that the gel strength of the gelatin is of first importance. If it is intended to produce a pint tablet, then that tablet must contain sufficient gelatin to form a jelly of the requisite strength when diluted with water to a pint, and this consideration, taken in conjunction with the weight of the tablet, determines the proportion of gelatin to be used in the recipe.

## Gelatin Testing.

For the testing of the gelatin, some form of jelly tester which will give comparable results for the strengths of jellies prepared from the various samples of gelatin is a *sine qua non;* the writer has found the tester evolved by the Research Association for the cocoa, etc., trades to be invaluable for this purpose. In testing the gelatin samples, it should be borne in mind that the strength of a gelatin jelly depends upon the following factors (among others):

Concentration of gelatin,
Temperature,
pH.

And it follows that the samples must be tested under conditions which are identical for all samples, so far as this is possible. The pH of the jelly will be conditioned by the acid present in the mixture, by the mineral content of the gelatin, and by the water used to prepare it; for these reasons it is advisable to test the gelatin samples with the addition of the same amount of acid as will be present in the finished pint jelly, it having been found that the presence of acid leads almost invariably to a diminution in gel strength. This loss in strength, however, is not constant for all samples of gelatin, the variation doubtless resulting from the difference in the buffering effect of the gelatins themselves.

Briefly, then, the scheme is to test the samples of gelatin, in the presence of the correct amount of acid, and so to determine which sample will most economically provide the jelly strength required. In general, it will be found that from 0·55 to 0·65 oz. of gelatin will be required to form a pint jelly of reasonable strength. The final choice of the gelatin will be governed by consideration of the clarity of the jelly it forms (the clarity also should be tested in a solution containing the correct proportion of acid), and of its colour, taste, and smell. To some extent the clarity is dependent upon the mineral content of the gelatin, and it is therefore desirable to examine the ash yielded by the gelatin samples; those having a high content of calcium and phosphate may prove troublesome in respect of cloudiness, though this may result from the presence of a small proportion of fat in the gelatin. Tests with hydrochloric acid and a fat solvent will quickly show which factor is responsible for cloudiness.

## Proportions of Ingredients.

It is customary to produce pint jelly tablets weighing about 5 ozs.—this weight providing a reasonable amount of sugar for sweetening purposes—and since approximately 0·55 to 0·65 oz. of gelatin is required per tablet, it follows that the proportion of gelatin in the mixture must be in the neighbourhood of 11 per cent. In order to provide for good keeping qualities in the finished product, its water content should not much exceed 20 to 22 per cent., and the proportion of glucose or of invert sugar (or of both, if both be present) should approximate to 30 per cent.

These considerations lead to a mixing somewhat as follows:

| | | |
|---|---|---|
| Sugar ... ... ... | 44 | lbs. |
| Glucose syrup ... ... | 30 | ,, |
| Citric acid ... ... | ¾ | ,, |
| Gelatin ... ... ... | 11 | ,, (approx.) |
| Colour and essence | | |
| Output ... ... | 100 | ,, |

In this case the moisture in the finished jelly will be about 21 per cent.; the exact proportion of gelatin will be regulated by its strength as determined experimentally. The use of glucose is probably to be preferred to that of invert sugar, owing to the difficulty of regulating the amount of inversion within the comparatively narrow limits required for good keeping qualities.

## Boiling and Mixing.

The process of manufacture depends to some extent upon whether the gelatin is used in sheet or powder form. If the former is used, it must be

soaked in cold water until it becomes supple; the use of powdered gelatin avoids the necessity for prolonged soaking, but it is desirable to moisten the powder thoroughly and allow it to stand for a short time before adding to the sugar boil, since this facilitates solution. In either case, the weight of dry gelatin will be, roughly, doubled by the absorption of water, and the height of the sugar-glucose boil must be correspondingly regulated so as to give the correct output weight. In the case of the recipe given above, the sugar and glucose, together with sufficient water for solution (1½ to 2 gallons), should be boiled to about 245° F. to yield a syrup of some 77 lbs. weight; this syrup is then transferred to a wheeled bogie or carrying-pan, and the soaked gelatin added to it, with gentle stirring to bring about solution of the gelatin. When all of the latter is dissolved, it is a useful precaution to pass the mixture through a fine hair sieve into a second pan, so as to remove any foreign matter derived from the raw materials. Following this the acid, colour, and flavouring matter can be added, and the whole thoroughly mixed, but without any violent stirring.

## Colouring.

In making a choice of the colours to be used, it should be remembered that the gelatin probably contains a fairly high proportion of sulphur dioxide, little of which is driven off in the course of manufacture. In consequence, the best results are obtained with colours which are fast to sulphur dioxide and metals, but if circumstances demand the use of colours which become bleached, the extent to which this occurs should be ascertained by trial, and the amount of colour correspondingly increased to allow for it.

## Clarifying.

The finished product is improved, both from the point of view of clarity and a lessened tendency to foam, if it is allowed to stand for a few minutes to permit the scum to rise; this is skimmed off, and the liquid jelly mass is then ready for pouring.

## Control.

As a means of controlling manufacture it is advisable to weigh a proportion of the finished batches of jelly, before pouring, to ensure that there is no loss through the yield being less than it should be, and that there is no risk of trouble through the correct yield being exceeded by any significant amount. Constancy of weight in the final output is also of advantage inasmuch as it leads to jellies of reasonably constant strength.

## Cooling and Setting.

The subsequent handling of the jelly depends upon whether it is to be poured into tins or upon slabs. For a small output, the use of tins correctly proportioned to give a slab of jelly which fits the cutting machine is practicable, though costly in labour. It necessitates filling a fixed weight of jelly into each tin, prolonged standing to allow the jelly to become cool and set, and a further handling when the jelly is removed from the tins.

By the use of water-cooled slabs, specially made for the purpose, the process of cooling is reduced to about 1 to 2 hours, and if the size of the batch is properly proportioned to the area of the slabs, no weighing is required. There is consequently a saving in labour cost and in floor space, and, in addition, the jelly is more easily removed from the slab.

Whichever method be adopted, the jelly should be poured out as gently as possible, and with the smallest pouring height that is convenient; in this way the entrainment of air which escapes only with difficulty, if at all, from the viscous mass is largely avoided, with a resulting improvement in the appearance of the finished jelly.

To facilitate removal of the jelly from the tins or slabs, they should be lightly wiped with an oily cloth, using "slab oil" or olive oil. The latter is the more effective, but has the disadvantage that it tends to become rancid, whilst it also makes the finished jelly more cloudy than does slab oil or a

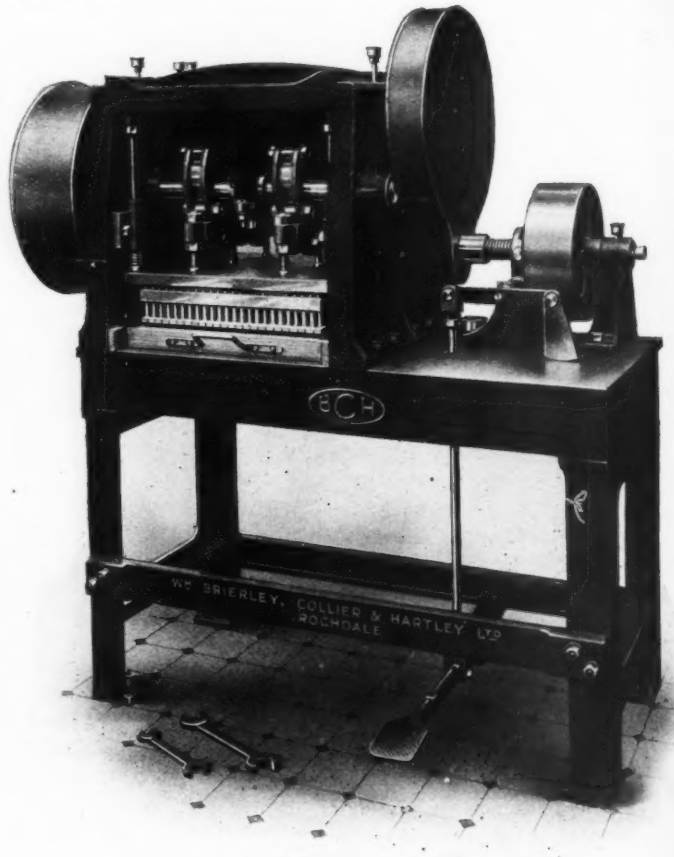
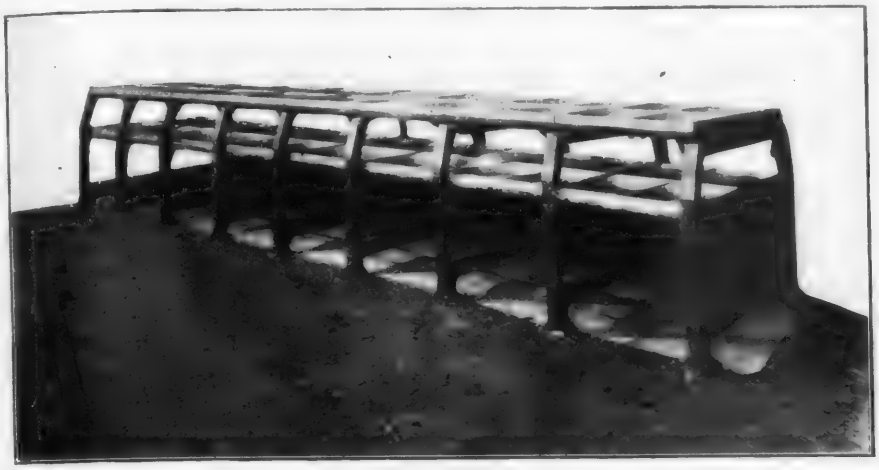



**Table Jelly Cutting Machine.**
*(By courtesy of Messrs. Brierley, Collier and Hartley, Ltd.)*

refined mineral oil; this is probably due to the greater ease with which olive oil becomes emulsified in the jelly whilst it is still liquid.

**Cutting.**

The jelly, when cold and set, is cut in a machine constructed for this purpose, the size of machine being correlated with the size of the tins or slabs used. The machine can be arranged simply to cut the large mass of jelly into pint tablets, or, additionally, to subdivide the pint tablets by further cuts through about half the thickness of the tablet, so making it easier for the housewife to pull the jelly into small pieces for dissolving.



**Unit of Jelly Cooling Plates.**
*(By courtesy of Messrs. Brierley, Collier and Hartley, Ltd.)*

**Packaging.**

The remainder of the process consists simply in wrapping the tablet, packing it into cartons, and finally into packages for delivery. For the wrap, a good quality waxed paper is essential.

If the output is large enough to warrant it, the wrapping and placing into cartons can be done by machine, with a consequent saving in labour cost; the plant for this purpose, however, is somewhat expensive, and the rather seasonal nature of the trade demands a high output to make the machine a paying proposition.

## The Film in the Food Industry

SEVERAL years ago the sales of the American Company of Fleischmann, manufacturers of yeast, seemed to have reached the limit of existing markets, and the problem arose of creating new markets and developing old ones. The story of yeast was told in magazines and newspapers, supported by personal testimonials, the demand for the Fleischmann product continuing to show an increase each year, but the company felt that the key to further development lay in securing the enthusiastic recommendation of their dealers at the point and time of sale, by selling to them on the "Yeast for Health" idea *for their own personal use*, so that they in turn could testify to their customers the beneficial results obtained.

Now it requires considerable time to explain the health value of yeast to each individual dealer in sufficient detail to make him a convert and a booster, especially as the sales schedule of the Fleischmann Company allows a salesman only three minutes for each call in order that he may cover his territory regularly. As this would not give sufficient time for a convincing talk, other means of educative propaganda had to be adopted, and a motion picture was decided upon for this purpose.

A three-reel picture entitled "Youth Regained" was prepared, but this proving too long, it was afterwards condensed to one reel of some 1,200 feet of film, requiring about eleven minutes to show. "Youth Regained" tells the story of the health value of yeast to the human system, and tells it in an interesting way that all can understand.

Because of the varied interest of the film there was little difficulty in arranging for showings in the leading theatres, schools, clubs, and social centres, and already the film has been shown to about a million people. It is hoped that when the campaign is finished the film will have been seen by 250,000 dealers.

The increased Fleischmann sales which have followed the showing of this film varied in the different districts from 30 to 80 per cent.

## Utilising Waste Fruits

IN the fruit and canning industry the wastes and culls now take a heavy toll. The California Citrus Fruit Growers, in co-operation with the Bureau of Chemistry and Soils, have solved the problem of utilising citrus culls and wastes from which lemon oil, orange oil, citric acid, pectin, orange juice, and cattle feed, etc., being produced, returning to the growers from $12 to $15 a ton. There are possibilities for making use of certain Illinois waste fruits through the application of chemical science.

By a process of fermentation the Bureau of Chemistry and Soils recently has been able to produce gluconic acid from glucose, a process which lends itself to commercial practice. Since the calcium salt of gluconic acid is readily absorbed by the tissues, thus raising the calcium content of the blood, it undoubtedly will not only have an important place in medicine, but also may become a valuable constituent of livestock feed, opening up a new use for glucose which is made from corn.

# The Concept of "Colloid" and its Importance for the Food Chemist

By DR. W. CLAYTON, F.I.C.
*Chief Chemist and Bacteriologist, Messrs. Crosse and Blackwell, Ltd., London.*

## Part V.—Froths and Foams

FROTH, OR foam, is the more or less stable extended air/liquid interface arising when bubbles persist at the surface of a liquid due to agitation, aeration, or ebullition. An enormous film-surface of liquid is presented to the gas phase, so that froth is primarily a labile system owing to the tendency for the interface to be reduced to a minimum.

Evanescent froths are formed when certain aqueous solutions of inorganic compounds are agitated. Thus a 3 per cent. NaCl solution shaken in a bottle produces a temporary foam, as does also 97 per cent. commercial $H_2SO_4$. Again, certain organic liquids, such as acetic acid, will permit frothing in aqueous solution. *No pure liquid will yield a froth.*

It was early recognised by Plateau that in bubbles and froths the two chief factors necessary are a certain degree of viscosity of the liquid used and a low air/liquid surface tension. The former tends to resist thinning of the liquid films to the rupture point, whilst a low surface tension is needed, since surface tension is the chief active force promoting thinning. High viscosity alone is of no avail; a low surface tension must accompany it. Hillyer demonstrated that 50 per cent. aqueous glycerin and a 6 per cent. aqueous solution of gum acacia, each very viscous, but with relatively high surface tensions, do not yield persistent froths, whilst beer and milk, not so viscous but having low values for surface tension, froth very readily.

The more persistent froths result when aqueous solutions of such compounds as saponin, soaps, proteins, rennin, are agitated, and in each instance it can be shown that the solute markedly lowers the surface tension of water.

Omitting discussion of the temporary frothing of electrolytes, which raise the surface tension of water, as the explanation is beyond the scope of a popular article, we can consider the subject from the point of view of the food chemist. The froths encountered in food technology are all connected with systems wherein the surface tension of water is lowered. In consequence, there is an accumulation of solute at the air/liquid boundary or interface. In other words, a concentration gradient exists.

Now the coalescence of bubbles in a liquid occurs when the bubbles approximate close enough so that the liquid between them is sucked out; such coalescence cannot be avoided in a pure liquid. To prevent this coalescence, the composition of the solution between the bubbles—*i.e.*, enveloping them—must be different from that of the main bulk of the solution. The accumulation of solute at the air/liquid boundary provides this condition. Frequently the absorbed solute undergoes certain irreversible changes, and the surface film around the bubbles is mechanically strengthened, either by a pronounced viscosity factor or an actual structural factor. Stability of the film is often assisted by the presence of small solid particles.

Important investigations by Ramsden bear on this matter. He showed that agitation of various protein solutions caused a separation of some of the solute in the form of fibrous or membrano-fibrous solids, and in some cases—*e.g.*, egg albumin—agitation served to heap up the solids to visible masses. Egg albumin dissolved in water and agitated can be coagulated and rendered permanently insoluble, even from the most dilute solutions. Such solid matter, whether in the form of an envelope around the bubble or only as solid *points d'appui*, greatly enhance froth stability. Other workers have supported these views and extended their experimental investigation.

### Milk Froth.

New milk froths very readily and is often a technical nuisance. Some dairies employ devices to avoid froth. One excellent method is to run the milk into a detention tank, drawing the milk continually from the bottom. Thus a round tank 16 inches in diameter and 36 inches high, permitting a foot head of froth, was described by Stevenson, to eliminate the froth from violently agitated milk at the rate of 400 gallons per hour, the time of detention being approximately $3\frac{1}{4}$ minutes.

Foam on milk is a disadvantage during pasteurisation. Thus in the "Holding Method," where the milk is held at 145° F. for 30 minutes, the froth on the surface of the milk may be air-cooled and undesirable micro-organisms not destroyed. The foam in commercial pasteurisers may be from 8-10° F. below the main bulk of the milk. The most recent plants either heat the air in the holder with steam or introduce such engineering modifications as prevent milk splashing.

Research by Siedel and Hesse demonstrated very conclusively that milk froth contained from 1·67 per cent. to 3·27 per cent. more protein than did the normal milk itself. There was no change in the ash content—*i.e.*, the inorganic constituents of milk play no part in frothing. Rahn has photographed the membranes following upon the collapse of milk froth in a separator. The same investigator showed that the addition of 0·5 per cent. of peptone to milk altered the character of the froth, due to a change in the composition of the absorbed solute at the bubble walls. On the basis of this and other experiments, Rahn developed his surface tension theory of butter churning, now generally accepted.

Homogenisation of cream reduces the "whipping" capacity of the cream, probably because homogenisation so increases the fat/aqueous interface as to lead to such pronounced protein absorption there that insufficient protein remains available to stabilise a froth.

# The Manufacture of Jam, Marmalade, Jellies, and Candied Peel

*The first two parts of this article, which deals with modern factory processes and equipment, appeared in the May issue and gave particulars of the manufacture of jam and marmalade. We are indebted to Messrs. Brierley, Collier and Hartley (Rochdale) Ltd. for these particulars.*

PARTS III AND IV

## Part III.—Candied Peel Manufacture

CANDIED AND drained peel is a trade closely allied to that of the jam manufacturer, and here, again, the plant required is not large. A great deal of the peel used in this country comes from abroad in barrels, immersed in brine for a minimum period of about six weeks to three months, the solution being approximately 2½ pints of brining salt to every gallon of water.

This brine is left cold, and as the peel is continually absorbing salt it is necessary occasionally to add more brine. After being removed from the wooden vats the caps are steamed or partially cooked in the steaming barrels mentioned above. The length of time this takes entirely depends on local conditions, the object being to make the peel tender. If it can be torn easily with the fingers this is a rough guide that the peel is ready. After cooking, the caps are allowed to stand in clear, cold water for about a day.

The next part of the process calls for the use of *candy pans*, which are steam-jacketed for a working pressure of about 60 lbs. to the square inch and in which the sugar solution is prepared. The peel caps are then dipped in this sugar solution and placed on galvanised iron trays, where the sugar drips from them. The caps are then placed in a warm chamber for drying purposes.

If the caps are to be disposed of whole, no further process is required; but if they are to be supplied cut into small pieces, a machine known as a *plunger peel cutter* is employed for the purpose. This machine consists of two square boxes fitted with interlocking blades. These blades can be made from ordinary steel, stainless steel, or phosphor bronze.

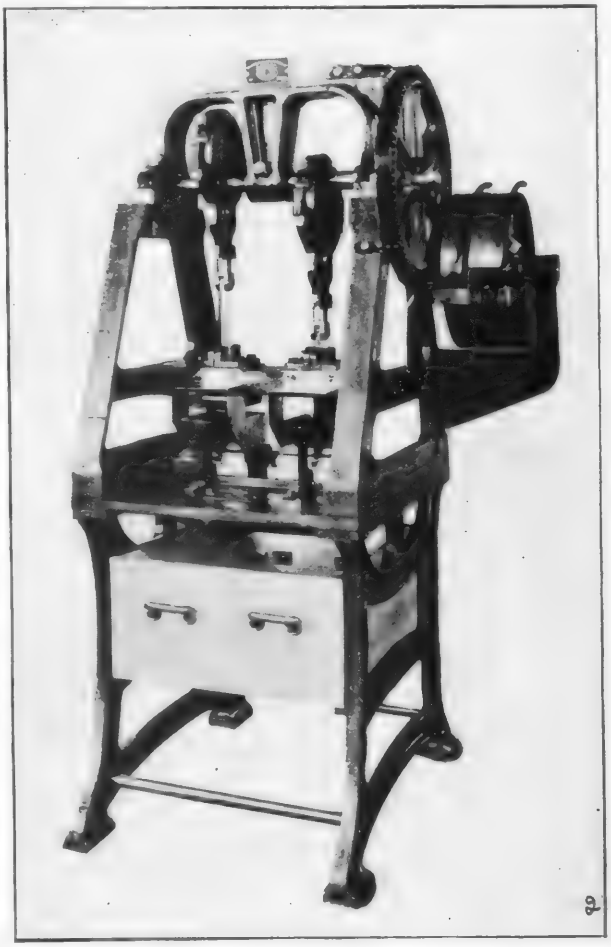
This type of peel is usually sold by grocers, and the average size is 5/8 by 3/16 inch, although blades can be supplied to fit the machine cutting pieces 13/16 inch square up to 1 by ¼ inch. The peel is placed on the knife boxes and a plunger descends, forcing it through the blades.

The larger size machine of the very latest type, which has been considerably improved during the last few months, is capable of an output of approximately 25 to 30 cwt. per day.

## Part IV.—Manufacture of Table Jellies

Table jellies can be manufactured in two ways, either from jelly crystal powders or in tablet form. The tablet form is infinitely more popular in Great Britain, although some countries prefer crystals—for example, South Africa. The boiling apparatus in general use is the pan mentioned at the beginning of this article. Then there are wooden tanks, in which the gelatine is soaked before being put into the pan.

For the manufacture of tablets, *cooling tables* are required, and a *cutting machine*. After the removal of the batch from the pan, the jelly is allowed to stand for about 20 minutes, so that the scum can



**Plunger Peel Cutter for Candied and Drained Peel.**

*(By courtesy of Messrs. Brierley, Collier and Hartley, Ltd.)*

rise to the top, and this is removed by skimmers. The cooling tables (see page 159) are of two kinds, and made with either two compartments or four compartments. They are either of cast-iron with water channels running through and covered with pure block tin, or of cast-iron with thick aluminium tops.

The plates are divided by bars, so that when the jelly sets it is the exact size for the cutting machine. The method of filling these plates varies, most manufacturers having their own idea. Some fill with hand ladles and bogies, others from a pan running over the plates and fitted with a valve in the bottom. Another method involves using bogies specially constructed so that a feed arm projects over the plates and the jelly is run into the different compartments to a predetermined thickness, the thickness naturally affecting the weight of the finished tablet.

The time of cooling depends upon circumstances, the weather and the surroundings of the plates having to be taken into consideration; the average time is about two hours, although it has been known in very favourable circumstances for the jellies to be ready for cutting in one hour. When ready for cutting, the sheets of jelly are removed from the plates and placed in a tray and put into the cutting machine (see page 158).

The machines can be supplied to cut either pint or half-pint size, but the most popular article at the moment is the pint size jelly cut with sub-divisions. The machine cuts the jelly right through, but each tablet is cut by other blades only three-quarters of the way through, thus making it easy for the housewife to tear these cubes apart and effect their ready solution. The standard machine cuts 48 pint size jellies at one stroke and can be worked at a speed of six strokes per minute. It will therefore be seen that the output entirely depends on the number of cooling tables.

Originally, firms used tin trays the size of the cutting machine, but these take about eighteen hours to cool unless placed on water-cooled tables. The disadvantage of this method, however, is that trays get knocked about and lose their shape and, in addition, the heat of the jelly distorts them. Consequently, after they have been through the cutting machine the jelly springs back to its original shape, and the result is a distorted piece which is not only ugly to the eye, but wrong in weight, as most jellies are sold with a guarantee of weight.

If the plates and the machine are used in conjunction it is almost impossible to obtain an ounce of waste.

## The Spoilage of Canned Peas

IT is stated in the annual report of the Agricultural Experiment Station of the Iowa State College of Agriculture that sporadic and costly outbreaks of "sulphur stinker" spoilage in canned peas and sweet corn have been studied and found to be due to an organism that withstands boiling temperatures for as long as eight hours and grows best at a temperature of 131° F. This spoilage is recognised as the first example of a new type, for which the name "sulfid" spoilage has been suggested. The contents of a spoiled can appear very dark in colour and emit a nauseating odour of hydrogen sulphide gas.

The organism found is a new species, and has been named *Clostridium nigrificans*. It has been isolated from soils and manure. It has been found that foci of infection may exist within the cannery, whose eradication would eliminate the trouble. Rapid cooling of the cans to room temperature prevents development of the organisms.

## Cellulose Sheets for Packing

(Hyden, *Ind. and Eng. Chem.*, 1929, 405-510.)

As a hygienic covering for foodstuffs, sheet cellulose, which is becoming more widely adopted, is essentially regenerated cellulose.

It was first prepared experimentally in 1893 by Cross, Beaven, and Beadle, and industrially in 1908 by Brandenberger.

Being simply regenerated cellulose, this type of wrapping is no more inflammable than ordinary paper, and has been classed along with common newsprint by the United States Underwriters' Laboratory. Further feeding tests on guinea pigs revealed no toxic effects. As a wrapper, it can be applied to baked goods, meats, frozen fish, sweetmeats, nuts, and tobacco, etc.

## Abstracts of Papers Read before the Society of Public Analysts, May 7, 1930.

*The Diastatic Activity of Honey.* By L. H. Lampitt, D.Sc., F.I.C., E. B. Hughes, M.Sc., F.I.C., and H. S. Rooke, M.Sc., A.I.C.

Honey diastase behaves in a similar way to other enzymes under varying conditions of temperature and pH, the optimum pH for both the dextrinogen-amylase and the saccharagen-amylase being about 5·3. The maximum dextrinogenic power is obtained at about 40° C. The amounts of reducing sugars formed increase with time, but after 16 hours the increase is slow.

*The Examination of Milk for Tubercle Bacilli.* By D. R. Wood, F.I.C.

A survey is given of the experience and results obtained in the examination of 1,000 herds in the county of Somerset during the last four years. The relative value of microscopical and biological tests is discussed, and experiments on the cytology of tuberculous milk are described. The limitations of veterinary inspection are pointed out, and the conclusion is drawn that the present methods are inadequate for the elimination of tuberculous milk.

# Centrifugal Separators

R. H. DOLTON, B.Sc., A.I.C.

## Part II.—Application of Centrifuges

IT IS not possible to mention all the uses of centrifugal separators in the course of a short article. The first separator was produced more than fifty years ago for the separation of cream from milk, but during recent years these machines have been adapted for the handling of oil and other industrial liquids.

**Centrifugal Separator at Work Recovering Beer from Rackings.**

*(By courtesy of Alfa-Laval Co., Ltd.)*

As might be expected, the purification of lubricating oil offers a wide field for the centrifugal separator. Crank-case oil from internal combustion and steam engines, both of the stationary and moving types, rapidly becomes contaminated with carbon, dirt and grit, water, etc.; sludge forms and the oil soon becomes unfit for use. This oil has then to be substituted by new oil, and the dirty oil either thrown away or reclaimed. The former process is very wasteful, as the cost of lubricating oil is high, and the engineer often tries to economise by using the same oil in the crank-case of his engine for long periods. This in turn leads to rapid wear of the moving parts, and is productive of serious engine trouble. If, however, the oil is purified by a centrifugal separator it is never allowed to get into a really bad condition, and hence engine wear is very greatly lessened.

Two systems of oil purification can be employed, the continuous method and the batch method. In the first of these two systems the oil is continuously circulated from the sump of the engine to the separator and back to the engine, with the result that impurities are never allowed to accumulate in the oil. With the non-continuous system the dirty oil is collected and purified in batches.

The saving in engine wear effected by continuous or frequent purification of the lubricating oil is very great, and to this has to be added the saving in oil, as it becomes unnecessary to throw any oil away, and new oil is only necessary to replace working losses.

Another application of the centrifugal separator is in the vegetable, animal, and fish oil industries. In the refining of these oils it often becomes necessary to remove from the oil mucilaginous and "footy" matter or to separate water. Once again the separator can give good results at high capacities, and these machines are successfully operating on soya bean, castor, olive, and cotton-seed oils, neats-foot oil, lard, cod-liver oil, whale oil, herring oil, and a host of others.

By the use of a centrifugal separator impurities can be removed in a far shorter time than when gravity settlement is employed and without the danger of contamination, which often results when filter methods are used. The risk of decomposition of vegetable and animal oils during and after purification is therefore avoided. An interesting example

**Centrifugal Separator at Work on the Purification of Animal Fats.**

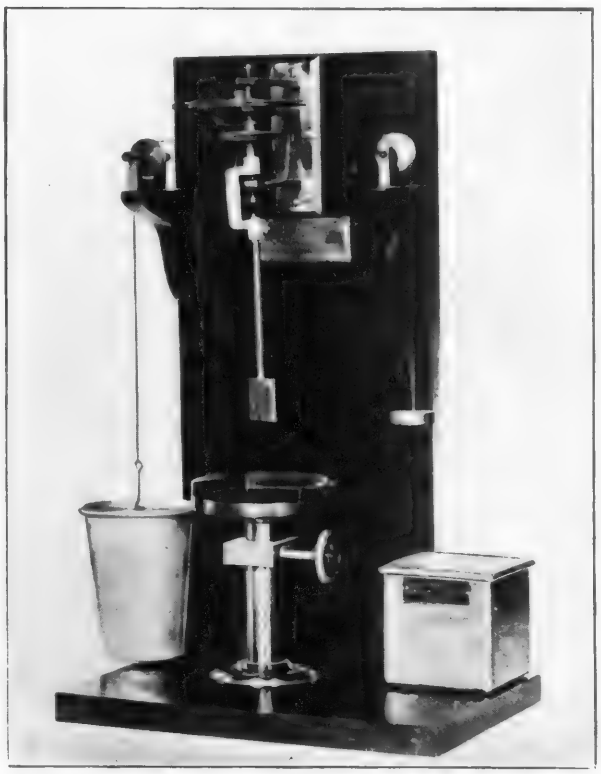
*(By courtesy of Alfa-Laval Co., Ltd.)*

of this is to be seen in connection with whale oil, much of which is now won in the Antarctic seas, and thus has to be brought across the Tropics to Europe. Before the use of centrifugal separators on

(*Continued on page* 164.)

# Jelly Testing

*The following particulars relate to an instrument designed by the British Association of Research for the Cocoa, Chocolate, Sugar Confectionery, and Jam Trades. The principle upon which it works was suggested by Dr. L. E. Campbell of the Association.*



THE PRINCIPLE of the jelly tester is that the "strength" of the jelly is measured by finding the force necessary to turn a vane in the centre of the jelly through an angle of 30 degrees.

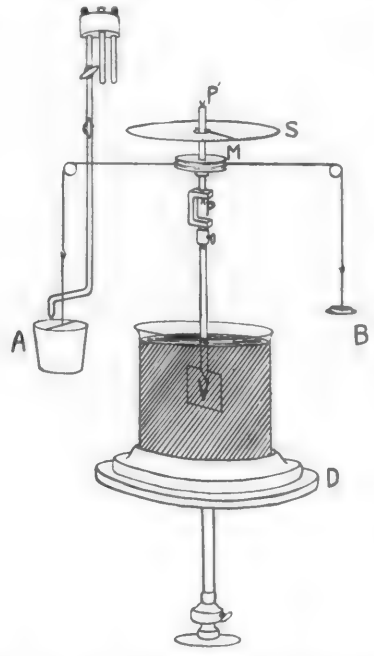
The vane V is turned by means of a thread passing round a grooved ebony pulley M and over two supporting pulleys. To the ends of it are attached an aluminium vessel A and a counterpoise B, and the aluminium vessel should just sink when a 2 gramme weight is placed in it. For testing purposes the jelly tester is fixed in a convenient position on a bench, with a tube leading into the aluminium vessel and in connection with two taps and a constant water level device. One of the taps is turned through such an angle that when the other tap is fully opened water flows at the rate of 100 c.c. per minute into the aluminium vessel. When testing a jelly the amount of water necessary to turn the vane through 30 degrees in the jelly is measured.

### PROCEDURE

1. See that the instrument is properly set up and is sensitive.

2. Make the jellies in the standard vessels provided. They should be filled so that when cold they are full to within ½ inch of the top. A standard procedure for making jellies and for storing them and controlling the temperature should be adopted.

3. When ready for testing turn the vane until it is parallel to sides of the tin and place the vessel containing the jelly on the movable platform. Raise the platform until the vane is in the centre of the jelly—*i.e.*, until the ring round the spindle of the vane is on a level with the top of the vessel. Adjust the movable part of the angular scale until pointer is at zero. Turn on the tap which admits water to the aluminium vessel, and turn it off again sharply as




soon as the vane has turned through 30 degrees. The volume of the water in the aluminium vessel is then measured or weighed and gives a direct measure of the strength of the jelly. If necessary, the instrument can be calibrated so that the figures can be given in terms of C.G.S. units of rigidity.

4. In testing gelatins the jellies should be ice-chilled and tested below 10° C. after not less than 5 hours. Fruit jellies should be kept at the same temperature overnight.

(*Continued from page* 163.)

whaling ships, much of the oil at the time of its arrival in Europe was of a low grade, but by the use of centrifugal separators it has been proved that large shipments can be brought home without any deterioration of the oil and increase in free fatty acid content. The clarification of liquids used in the foodstuffs and allied industries forms an important application of the separator.

# Sugar Inversion and other Phenomena in Jelly Making

By G. M. COLE, R. E. COX and G. H. JOSEPH.

*The following paper gives some important results of an investigation carried out in the Research Department of the California Fruit Growers' Exchange.*

PART I

## Introduction.

THE EARLY literature on pectin jellies abounds in lengthy discussions concerning the inversion of sucrose in the jelly cooking operations and in considerations of the various factors which govern the extent of such inversion. As a result of these investigations, it has been shown that a certain degree of inversion is desirable for inhibiting crystallisation of sucrose in finished jellies, although the actual extent of beneficial inversion has been a question upon which various investigators have failed to agree.

Tolman, Munson, and Bigelow* as early as 1901 pointed out that in pure fruit jellies cane sugar was inverted during jelly making, and that the extent of inversion varied with the time of heating and the nature and kind of acid present. The publications of Miss Goldthwaite† dealing with pectin jellies also mentioned the question of inversion. Her results are quite in agreement with those of Tolman, Munson, and Bigelow. Tarr and Baker‡ also have made studies of the sucrose inversion in jelly making. They state that a moderate amount of inversion is necessary for the production of the best jellies. Quite recently Fiedler§ has published some work dealing with the influence of sugar inversion on jelly formation. This latter investigator stated that satisfactory jellies could not be made using pectin with glucose or with invert sugar. He interpreted his data to show that the inversion of sucrose in pectin jellies causes the pectin to lose more or less of its jellifying power, depending upon the extent of inversion, and concluded that pectin will not form jellies with invert sugar. He based his conclusions on results of experiments in which he boiled the jelly batch containing pectin, sugar, and water for 10-minute periods both with and without the presence of the requisite amount of setting acid in the batch during the cook. He noticed that with the acid present during the cook a great weakening in jelly firmness resulted which was observed to be greater at higher sugar concentration. He attributed the weakening to inversion of sucrose by the setting acid during the cook, and ascribed the increased weakening at higher sugar concentrations to the increased rate of sucrose inversion, which, theoretically, should result, considering the elevation of the boiling point. Although not expressly stated by Fiedler, it is evident that the increased rate of inversion, together with the presence of greater initial amounts of sugar, would result in larger ratios of invert sugar to pectin, which, according to Fiedler, produces poorer jellies.

The present paper attempts to aid in clarifying the situation concerning the effect of sugar inversion on the formation of pectin jellies and to point out an heretofore generally unrecognised phenomenon, which may account for the failure of many commercial jams and jellies as well as for many erroneous conclusions in experimental work.

Fiedler's interpretation of his experimental data would imply that sucrose is essential to a satisfactory pectin jelly. That such is not the case is attested by the fact that some American jelly manufacturers who make high quality jellies deliberately invert their sucrose solutions before the preparation of jellies. If proper precautions are taken, excellent jellies may be prepared from commercial glucose-syrup and from dry corn sugar (cerelose). As an example, a small test batch may be made to contain:

| | |
|---|---|
| Glucose-syrup ... ... ... | 795·0 grams |
| Water ... ... ... ... | 254·5 „ |
| "100" grade dry pectin* ... | 10·5 „ |
| Total weight ... ... | 1060·0 grams |

(For "160" grade pectin, use: water 258·4 grams, pectin 6·6 grams.)

The glucose-syrup, heated by steam until it is quite fluid, is poured into the pectin dispersion, and, after stirring, the batch is poured into containers, in which the proper amount of setting acid has already been placed. These glucose jellies, containing fruit flavours and colours, are usually made in 50 to 100 kg. batches in America.

* Tolman, Munson, and Bigelow; *J. Am. Chem. Soc.*, 23, 347-353 (1901).

† Goldthwaite, N. E.; *J. Ind. Eng. Chem.*, I, 333-340 (1909); *ibid.* II, 457-462 (1910).

‡ Tarr and Baker; *Bulletin No.* 136, "Fruit Jellies, II: The Role of Sugar." Univ. of Delaware Agri. Expt. Sta. (March, 1924).

§ Fiedler, K.; *Konserven-Industrie*, 15 (No. 29), 405-407; (No. 30), 427-428 (1928).

* The weight ratio of cane or beet sugar to pectin used in a 65 per cent. sugar jelly of commercial firmness is referred to as the "grade" of the pectin.

Any assumption that inversion of sucrose appreciably affects the ability of a pectin to form a jelly might be construed as indicating that a chemical change involving sucrose and pectin was implicated in the formation of pectin jellies. That this is not the case, and, in fact, that no sugar at all is required, is demonstrated by the fact that the authors have prepared jellies of good quality containing from 65-84 per cent. of anhydrous glycerol and no sugar whatsoever. We have also prepared jellies using other dehydrating agents such as ethyl alcohol, glacial acetic acid, and calcium chloride solution. Spencer* has recently described the preparation of potassium ferricyanide, as well as glycerol and alcohol, jellies, in which no sugar was used.

## Inversion of Sucrose during Storage of Jellies and its Effect on Jelly Texture.

A pectin jelly is conceived of as having a framework of pectin micella, the voids in the framework being partially or wholly filled with the liquid phase. In such a case it should be possible for sugar inversion to proceed after the jelly has formed, even at room temperatures. That such is the case may be shown by the data in Table I.

TABLE I.

THE RATE OF SUCROSE INVERSION IN PECTIN JELLIES.

| *Kind of Pectin.* | "160" *Grade Citrus Pectin.* | | | | |
|---|---|---|---|---|---|
| pH of jelly | 2·09 | | | | |
| Days of storage at 28° C. .. | 1 | 31 | 60 | 91 | 113 |
| Per cent. sucrose inverted during storage .. .. .. | 28·8 | 71·5 | 91·3 | 97·5 | 99·0 |
| Average velocity constant of inversion (calculated from data) | $0{\cdot}2820 \times 10^{-4}$ | | | | |

The water jelly mentioned in Table I. was made by the standard laboratory method described by Wilson.† The extent of sucrose inversion in the individual 2-oz. samples of jelly was measured by use of the Benedict Reagent, which was standardised upon the U.S. Bureau of Standards sucrose which had been inverted by A.O.A.C.‡ methods.

The important fact to be mentioned about the jellies listed in Table I. is that after 99 per cent. of the sucrose had been inverted, the jellies still retained their original firmness, clarity, and texture. Samples of these jellies were turned out of their glasses after a storage of 113 days at 28° C. and allowed to stand on open plates for several days. The syneresis, or "weeping," observed was just the same as it was for the original jellies in which only a small portion of sucrose was inverted. These data are convincing evidence that inversion proceeds in a uniform mathematical manner and at a rate which gives a velocity constant falling within the range usually covered by the sucrose inversion constants in comparable systems. Furthermore, they add to the evidence that pectin jellies resemble other gels in that certain reactions may proceed in them as well as in the corresponding liquids.

## The Preparation of Invert Sugar Jellies.

The data in Table I. indicate that practically complete inversion of sucrose in a jelly after its formation does not appreciably alter the properties of the jelly. The following data will indicate to what extent it is possible to affect the properties of a jelly by causing the sucrose to be practically all inverted before the gelation of the batch.

For the purpose of this experiment "160" grade citrus pectin similar to that employed by Fiedler was used, and enzymic inversion was resorted to for reasons which will later be made obvious. The jelly formula used was as follows:

| | |
|---|---|
| Citrus pectin, "160" grade ... | 2·7 g. |
| Sucrose ... ... ... ... | 432·0 g. |
| Water ... ... ... .. ... | 229·3 g. |
| Tartaric acid ... ... ... ... | 6·0 ml. |

(373·6 g./litre solution.)*

One batch of jelly was prepared by mixing the dissolved sugar with the pectin sol, adjusting to weight at the boiling temperature and pouring into three glasses, each containing 2 ml. of the standard* acid solution. A second batch of jelly was prepared in a similar manner, except that the sucrose solution was treated with invertase until measurements with the polarimeter indicated 96 per cent. inversion.

It is apparent that the methods of preparation for these jellies were identical except that in the second case approximately 96 per cent. of the sucrose had been inverted before preparation of the jelly. It is significant that, although the gelation of the invert sugar batch, when allowed to cool after pouring into the glasses, required 25 minutes as compared to 6 minutes in the case of the sucrose jelly, no appreciable difference in firmness nor weeping of jellies could be discerned when examined 3 hours after gelation and again 24 hours later.

It is evident from the foregoing that sucrose inversion, which takes place during the ordinary jelly cook, cannot account for the jelly failures such as Fiedler describes, for it seldom, if ever, proceeds to the extent of 96 per cent. inversion in usual commercial practice. A further explanation must be sought, and it was to this end that enzymic rather than acid inversion was resorted to in the above experiment. It is to be noted that in this experiment in neither case was the pectin and sugar mixture boiled, nor held for any appreciable length of time before gelation, in the presence of the acid employed for gelation. It will be shown in what follows that although Fiedler's jelly failures were due to the presence of the acid during the cook, the inversion of sucrose was incidental and not a factor in determining whether or not a good jelly would result.

* Spencer, Gene; *J. Phys. Chem.*, 33, 1987-2011; 2012-2020 (1929).

† Wilson, C. P.; *Ind. Eng. Chem.*, 20, 1302-1307 (1928).

‡ "Methods of Analysis," *Assoc. Off. Agri. Chemists*, 2nd ed., 1925, p. 186.

* Acid of this concentration is commonly used by preservers. It is usually made by dissolving ½ lb. tartaric or 1 lb. crystalline citric acid in one pint of water.

*(To be continued.)*

# Recipes

## Calves' Foot Jelly

*The following particulars of the methods of preparing calves' foot jelly appear to represent good, old-fashioned practice.*

THE chief essential in producing this jelly is to have it brilliantly transparent, and of good flavour. Well clean the feet, and divide, placing 100 lbs. of feet in the pan with 10 galls. cold water, 2 lbs. sliced onions, 2 lbs. sliced carrots, and ¼ lb. each of whole pepper, celery seeds, and green herbs (thyme, etc.), tied up in a muslin bag. Turn on the steam and bring slowly to the boil, simmering for about eight hours, and adding water to replace loss. Then draw off the liquor and strain. Allow to cool, and when it gels, remove the grease from the top and return jelly to the pan, adding 16 fl. oz. lemon juice (filtered), or 1 oz. powdered tartaric acid dissolved in a little water. Turn on steam and take up to 180° F. Mix 3 pints white of eggs, (no yolk) with 3 pints cold water, crush the egg-shells and add thereto. Stir whites and shells thoroughly into the melted jelly, bring to the boil, and strain through a flannel jelly bag previously wetted with water. Instead of egg whites, blood is sometimes used as a clarifier.

The above makes a fine jelly, as it resolves itself simply into making gelatin from the calves' feet. Flavoured as above, the jelly has also been sent out labelled as meat jelly, yet it is open to the maker to vary the onions, carrots, and flavourings, or omit entirely, if a plainer jelly is desired.

Some quite ordinary calves' feet jellies are made of part jelly from feet, and part jelly made with gelatin and sugar. Lemon juice is added as a flavour, and sometimes, especially in the higher qualities, wine or spirits is added, but this places difficulties in the way of universal retail distribution, therefore the maker must modify instructions to meet particular conditions. Two or three per cent. of finest edible gelatin in water will produce a trembling jelly. A dozen medium sized calves' feet should produce about 5 galls. of jelly, but this depends upon the amount of "meat," or gelatinous tissue on the feet.

Another process is to take 5 galls. stock jelly from feet, or otherwise, add the rasped rind of a score of lemons, the juice of forty, and 8 lbs. finest crystal lump sugar, twenty bay leaves and fifty cloves, forty whites (and shells) of eggs, a foot of stick cinnamon, and a little crushed coriander seeds. Bring slowly to the boil, then shut off steam and cover over for about ten minutes. Then run through the jelly bag and repeat till clear. Some firms run jellies through a filter press. It is necessary to keep the jelly warm (or from chilling) during filtering through the bags. When the jelly is quite clear, then the wine or spirit is added, as the jelly is taking its last run through the bag.

Isinglass produces a jelly with a more delicate and velvety flavour than gelatin.

Another useful process which may be rearranged by the jelly maker is to take for 3 galls. jelly—2 lbs. leaf gelatin, 5½ galls. water, 5 lbs. loaf sugar, a dozen bay leaves, two dozen cloves, 1½ ozs. coriander seeds, 22 egg whites and shells, the juice of 22 lemons, rasped rind of one dozen lemons, one foot of stick cinnamon, 1½ pints sherry and 1 pint brandy.

Soak gelatin in one third of the water. Pour the rest of the water in the pan, mix in the whites and shells previously beaten, also others, except wine and gelatin. Stand over a slow fire, or turn on the steam gently, whisk all together, and when hot, stir in the gelatine and the remainder of the water. Whisk up until all comes to the boil, then stand at side of the stove, or ease off steam.

Cover over for fifteen minutes, then add the alcoholics and filter very bright.

The flavourings are altered to suit, but the "just ordinary" jelly is a jelly with sugar to sweeten and flavoured with lemon juice. Some of the other citrus fruit juices may be added as a change—tangerine, grape-fruit, etc—and good fruit juices, plain or as concentrates, may be included for the alcoholic additions.

### Plain Calves' Foot Jelly.

Put 10 lbs. of white gelatin into a tub with 8 galls. of cold water and let stand over night.

Put one gallon of cold water in a wood pail and gently sprinkle half-pound of egg albumen on the top of the water, but do not stir up; just let it stand and stir up next morning.

Next day put in a steam pan the following: 2 galls. of water, 21 lbs. white sugar, 4 ozs. coriander seeds, ½ oz. of cloves, 24 lemons cut up, 4 ozs. of citric acid, and bring to boil and see that all sugar is dissolved. Shut off steam. Now add the gelatin and water from the tub and stir well. Then add the albumen and water from the pail and stir well together. Now gently put on steam and keep well stirred so that it does not burn. Bring to boiling-point, but do not let it boil, otherwise it will not set.

Let stand 10 minutes; then skim the top off and put the jelly into jelly bags. Repeat the filtering process until the jelly is quite bright. Keep jelly bags covered up so as to maintain them hot. Then bottle and cork or cap. Sterilise in open tank of water for two hours, at 160° F. for one hour and 180° F. for one hour.

### Flavoured Calves' Foot Jelly.

Make plain calves' foot, and then add the colour and flavour.

*Lemon.*—Add to a batch of plain calves' foot 8 ozs. of essence of lemon and colour yellow with saffron (say, 1 oz. to 1 pint of hot water; use only the minimum quantity).

*Orange.*—Add to a batch of plain calves' foot 8 ozs. of essence of orange and colour with a little orange colour.

*Sherry Wine.*—Add to a batch of plain calves' foot 2 pints of sherry wine.

*Port Wine.*—Add to a batch of plain calves' foot

2 pints of port wine and colour with a little carmoisine.

*Madeira.*—Add to a batch of plain calves' foot 1 pint of port wine, 1 pint of sherry wine, 2 ozs. essence of orange, 2 drops of oil of natural bitter almonds (colour as port).

*Champagne.*—Add to a batch of plain calves' foot 4 ozs. of essence of orange, 4 ozs. of essence of lemon, 2 drops of oil of angelica. Colour light pink.

*Rum, Brandy, etc.*—Add to a batch of plain calves' foot 2 pints of brandy or 2 pints of rum and colour with sugar colour (caramel).

*Liqueurs.*—Put into the plain calves' foot batch sufficient to flavour of any leading liqueur, such as Benedictine, Chartreuse, Maraschino, Curaçao, etc. The amount added of the wines and spirits above will act as a guide, although less is usually needed, liqueurs being stronger.

In cheaper grades of jelly, the liqueur essences only are employed.

Note that all colours, wines, and essences must be added before going into the jelly bags.

**Jelly Crystals.**

28 lbs. fine castor sugar.
5½ lbs. powdered gelatin.
½ lb. citric acid (powder).
4 ozs. essences.

Rub the essences and colour (the latter dissolved in the minimum quantity of water) into the sugar, and pass the whole through a coarse sieve.

Then add the gelatin and acid, mix again, and pass through the sieve once more to break up all lumps. The mixing should yield 136 pint packets at 4 ozs. to the pint.

**Lemonade Crystals.**

56 lbs. B. castor sugar.
2½ lbs. citric acid.
8 ozs. oil of lemon.
6 ozs. of a 5 per cent. solution of tartrazine in water.

Rub the colour and lemon oil into a few pounds of the sugar, which should then be thoroughly mixed with the remainder of the sugar and the citric acid. The whole should then be rubbed through a coarse sieve to break up lumps and disperse the colour and flavour throughout the mass. To avoid the mass becoming sticky it is advisable to let it stand in the open room for a few hours—overnight for preference—before packing.

A freer-running product is obtained if 15 to 25 per cent of the sugar is replaced with cerelose.

# Correspondence

*To the Editor.*

DEAR SIR,

My original letter was not intended as a contribution towards a debate upon the merits and demerits of the lacquered can, but as a protest against wild sweeping statements. In an endeavour to keep Mr. Matthison to a point, I propose to examine the situation afresh and to trace the course of the controversy which has arisen; I go back to your issue of May, 1929. Mr. Norton, in an interesting statement, said, *inter alia*: "*Lacquers will answer with certain products only.*" This caused Mr. Matthison to enter the lists, and in your June issue we find him saying:

> "It has been proved that a properly lacquered tin prevents contamination, *corrosion, pinholing*, and other faults, and *preserves the life of the pack*. Further, I have no hesitation in claiming that a properly lacquered tin with a perfectly homogeneous film of lacquer will successfully resist the action of every known foodstuff."

Therefore Mr. Norton is told "that he is quite wrong."

Mr. Norton, in a very kindly way, points out that Mr. Matthison's claim is not supported by two authorities, *vide* letter on p. 206, July issue, and suggests that his remark was justified. It is at this stage that Mr. Matthison warms to his task. I shall touch upon a few of Mr. Matthison's August remarks, but the letter should be read in its entirety.

> "If, also, a lacquered film is scratched or broken a breach is made in the protective barrier through which the chemical action takes place. It is a fact that such action is often severer than if the tin had not been lacquered at all, but this is no fault of the lacquer, but due entirely to faulty methods of application of the lacquer or careless treatment of the tinplate after lacquering."

It is at this point that Mr. Matthison begins to hedge a bit by forsaking to a degree the matter of corrosion and introducing as a secondary issue the advantages of lacquer as a colour and flavour preserver. He does this with great skill. It is in August issue that Mr. Matthison also launches his attack upon the industry in America.

Dr. Kohman, in October issue, controverts Mr. Matthison's embracive statements, and in unequivocal language deals with the question of lacquer and can corrosion. Dr. Kohman says: "Without a single exception, all fruits give rise to more prompt formation of hydrogen swells and perforations when canned in enamelled (lacquered) cans than they would

if canned in cans made of similar tinplate, but not enamelled." The use of lacquer as an aid to the preservation of certain colours is freely admitted—in fact, it was never in dispute. Dr. Kohman also protests against Mr. Matthison's reference to experience in the American industry.

Then, in November issue, came the reply to Dr. Kohman that compelled my protest. The re-reading of Mr. Matthison's letter more than ever convinces me of the difficulty of pinning him down to definite points. He covers up his own track in the controversy by retirals. Thus: "As to the results obtained in the canning industry, either at home or abroad, I can only accept the evidence available second-hand." On one point he admits his opinion is valueless and another "he amends," and he even gets as far as turning a former dogmatic statement into a remark that "*quite possibly it is so.*"

At the same time he introduces further statements and half suggestions derogatory to all but the industry he supports. What do we find? The suggestion that he could speak authoritatively because "The statements I made were the results of practical tests made with British tinplate, British grown fruit, British made lacquer, and British canning conditions. Dr. Kohman's evidence is based on American conditions in each respect." Let us here pause to note how authorities in Britain fail to support Mr. Matthison. "Mr. Hirst did not think we in this country (Britain) had enough scientific information on the subject to warrant our making definite statements." He claims only for benefit in colour and flavour with certain fruits, which no one so far has denied. Mr. Morris is quoted as saying: "Coloured fruits should be packed in lacquered cans despite occasional trouble from perforations—*i.e.*, corrosion." Having made the inference that Dr. Kohman would have found different and presumably better conditions if he had worked with British material, Mr. Matthison then says: "I have often been told that British tinplate is superior for fruit canning purposes to American."

Who told him this is not disclosed. His ready acceptance of the tale about the American tinplate comes strangely after his admissions in his book *Stoving Finishes*. Here are some: "It is always rather difficult to compare foreign methods with British, especially when, as a result, candour compels one to admit that the foreigner's results are sometimes superior. The standard of workmanship, design, and finish of the American tin printer for all classes of tablet or box is, generally speaking, higher than that of the British . . . the varnish finish I must reluctantly admit is too often better than the British average . . . speaking generally, the American finish is better than ours." Then comes a wondrous admission, difficult to square with his claim in his letter to you. "American tinplate appears to have a better surface for printing and varnishing than British." There are other like admissions, but there is no need to take up your valuable space by quoting at length.

To summarise the situation as I see it, Mr. Norton is first attacked upon the point of lacquer and corrosion, Dr. Kohman intervenes, and Mr. Matthison, unable to disprove the doctor's plain statements, changes his ground and proceeds to knock down several bogies that he himself set up. I make protest against what I think is an unfair attack, and the reply from Mr. Matthison is just as full of remarkable but erroneous statements as any of his former letters.

Yours faithfully,
S. CRAIG BAIN.

* * *

*To the Editor.*

DEAR SIR,

I have been interested in Dr. Ottiker's article on "Crustless Cheese" in your May number, especially in view of my own findings recently published in *The Analyst* (March, 1930, page 191).

My experience is that both pure tinfoil (100 per cent. tin) and tinfoil containing tin alloyed with antimony are used in the wrapping of crustless cheeses. (Dr. Ottiker's reference to pure tinfoil containing lead and antimony in the second paragraph is obviously a contradiction in terms, especially as he alludes later to tinfoil containing only chemically pure tin.) Further, whether or not antimony plays any part in the blackening of the foil, it certainly does penetrate into certain cheeses, which have become appreciably blackened as a result of being wrapped in antimony tinfoil. Elten, however, reports finding tin only in the cheeses he examined, although all the wrappers contained antimony, whereas I found both tin and antimony—in one case amounting to 160 and 17 parts per million (1·12 grains and 0·12 grain per lb.) respectively. In Dr. Ottiker's researches, also, tin only is stated to have been found. The fact that antimony also can obtain access to cheese is a strong argument in favour of the abandonment of the use of foils containing this metal (which is a cumulative poison), unless a suitable means of protection can be devised.

Of several types of crustless cheese examined I found that it was the Gruyère variety that was most liable to blackening, Cheddar and Cheshire being but little affected. Even admitted that tin in the small quantities mentioned is without ill effect upon the consumer, it is well to remember that a cheese with a blackened wrapper and surface creates a prejudice in the minds of many people against continued purchase.

Further, although correctly informed, consumers may scrape the surface of the cheese prior to eating, others ignorant of the cause may well suspect decomposed cheese or lead and proceed no further.

Dr. Ottiker's findings that the tin content increases with age is doubtless confirmed by my own observations that the blackening also increases with age.

This being so, it ought not to be beyond the wit of man to devise a means for the complete prevention of what is admittedly an undesirable change both in the appearance of the foil and of the cheese contained therein.

Yours faithfully,
C. H. MANLEY,
*City Analyst, Leeds.*

*To the Editor.*

DEAR SIR,

I have the following comments to make on Mr. Manley's letter. So called "pure tinfoil" is generally considered commercially to be an alloy of tin with 0·1 to 0·5 per cent. of lead and 1 to 3 per cent. antimony; it is of course misnamed.

Chemically pure tinfoils are so soft, that those thinner than 10 gauge are not free from pinholes and generally break in the wrapping machines.

In our laboratory at Yeovil we have not specially determined antimony in the cheese; it has been looked for, and the method of analysis adopted in confirming the tin by dissolving the oxide in potash and finally titrating with iodine cuts out the possibility of its being present at least in one-tenth the amount of the tin found, for the titration result in all cases was very nearly equal to the oxide determination. This of course only applies to determinations of tin in our own cheese and using our own special protected foils.

For Mr. Manley's information I would like to let him know the method we are using at Yeovil for the determination of tin in cheese.

The method consists in dissolving 100 grams of cheese in nitro-sulphuric acid, heating until colourless, diluting with water, neutralising with ammonia, acidifying with sulphuric acid, precipitating tin sulphide with $SH_2$, filtering off the precipitate, redissolving in caustic soda, reprecipitating by acidifying with hydrochloric acid, filtering; washing with dilute ammonium acetate and acetic acid solution and igniting to tin oxide and weighing; confirmation being obtained by dissolving the tin oxide in molten potash, dissolving in water, acidifying with hydrochloric acid, reducing with aluminium and titrating with iodine.

The method is checked by adding known amounts of tin dissolved in hydrochloric acid to cheese free from tin.

Not only the method of analysis, but also the amount of tin lost from foils wrapped on cheese, was confirmed by weighing foils before wrapping and after varying periods of contact with portions of cheese varying in weight up to 4½ ozs., at summer and ordinary temperatures; the foils were washed with hot water, alcohol, and ether, dried and weighed, and then melted in coal gas and again weighed. Blank experiments were conducted with foils not wrapped on cheese as controls.

Although a large number of analyses and determinations of loss of tin from foils were made, in no case was more than 16 milligrams of tin found in one portion of cheese or lost from one foil, and when coated foils were used, generally less than half this amount (in every case less than one grain of tin per lb. of cheese).

Yours faithfully,

A. E. OTTIKER.

## Enquiries

104. Please advise me as to how mould can be prevented from forming on lemon curd. The mildew forms under the wax tissues, and when a small air pocket is formed, owing to the tissue not being pressed down on the curd, the mildew develops rapidly. The lemon curd is of a fairly stiff consistency, and is stored in a dry place at about 58 to 60° F., yet the mildew develops after only one month in stock.

105. Can you recommend a preservative which will keep bottled milk-soda in good condition (in India) for at least seven days?

106. A South African firm requires names of manufacturers of paper or pulpboard bottles for milk.

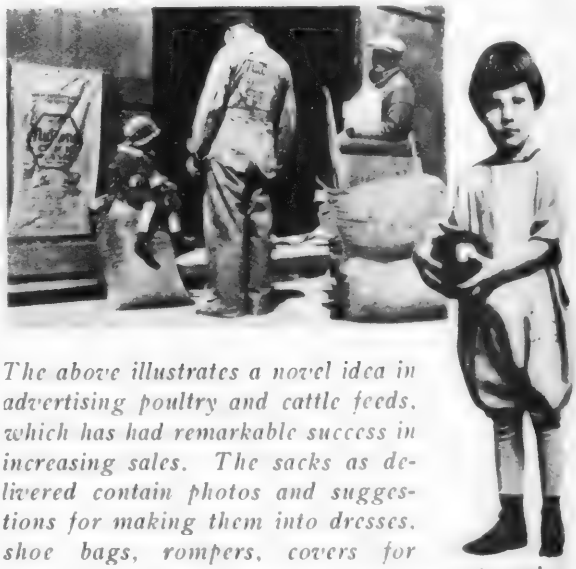
107. Required by firm in India, names of suppliers of butter, lard, and margarine, especially for biscuit purposes.

108. Required, names of manufacturers of honey extractors.

109. A correspondent asks for makers of machines suitable for the preparation of tomato pulp, including machines for washing, grading, pulping, and concentration.

110. What is the best method to adopt to prevent fermentation in pickles?

111. A firm contemplates putting up cream in small glass or tin containers and requires names of manufacturers of machines and containers for this purpose.



*The above illustrates a novel idea in advertising poultry and cattle feeds, which has had remarkable success in increasing sales. The sacks as delivered contain photos and suggestions for making them into dresses, shoe bags, rompers, covers for chairs, Ford seats, curtains, handkerchiefs, and so on. All the young ladies in the firm's office wear golden smocks.*

## Egyptian Market for Jams, Jellies and Marmalades.

ALTHOUGH EGYPT produces large quantities of jams the local production cannot meet the requirements of the European population, according to information furnished by American Commercial Attaché Charles E. Dickerson, Jr., at Cairo, Egypt. Great Britain is by far the most important supplier of jams. The most popular jams in Egypt are apricot, marmalade, orange, mixed fruit, plum and apple, generally imported in glass jars containing one pound and sold to the wholesalers at P.T. 35 to 50 per dozen, according to the quality. Switzerland is the next most important supplier.

The following table shows imports of jams, jellies, and marmalade into Egypt during the years 1927, 1928, and 1929, in pounds:

| | 1927. | 1928. | 1929. |
|---|---|---|---|
| United Kingdom ... | 353,825 | 399,895 | 432,468 |
| Belgium ... ... | 28,607 | 30,368 | 40,596 |
| France ... ... | 18,239 | 12,789 | 10,763 |
| Greece ... ... | 41,336 | 44,116 | 39,498 |
| Holland ... ... | 23,100 | 38,428 | 28,322 |
| Italy ... ... | 18,852 | 13,860 | 32,893 |
| Switzerland ... ... | 74,787 | 88,098 | 91,533 |
| Other Countries ... | 14,616 | 34,372 | 31,111 |
| Totals ... ... | 573,362 | 661,926 | 707,184 |

## Venezuelan Confectionery Trade.

Apparently no change took place in the Venezuelan confectionery trade during 1929, reports Assistant Trade Commissioner O. R. Strackbein, Caracas, March 8, 1930. According to official statistics, Venezuela imported 2,663,156 lbs. of confectionery and sweets in 1928. Of this total 63,933 lbs. represented chocolates. In this connection U.S.A. statistics showed exports of 98,727 lbs. of chocolate to Venezuela during 1929, compared with 71,861 lbs. during 1928. Exports of other confectionery to Venezuela in 1929 was 819,630 lbs., compared with 556,960 lbs. in 1928. American fruit drops, chocolate bars, and chewing gum lead in this market, while high grade confectionery, especially boxed candy from France and England, has the lead. This is attributed to better presentation, greater variety of fancy boxes, and impression of better lasting qualities among the Venezuelans. American advertising is said to be notably weak in this market. Prices of American goods are reported to be competitive.

About six local factories make chocolate candies, which compete strongly with imported confectionery, and sugar "marbles" and gum drops on a small scale. Hard caramels are in great favour. Locally made chocolate bars sell at 1s. 3d. to 2s. 10d. per pound at the factory, and chocolate-covered caramels and chocolate caramels at 8½d. to 9d. per pound.

## Market for Confectionery in Colombia.

Colombia offers an excellent market for confectionery. There was a steady increase in imports of confectionery from 1923 to 1927, and it is believed that 1928 imports continued the trend. Economic depression during 1929 caused a decline both in the importation and local production of confectionery, but this is believed to be a temporary period of readjustment, followed by improving conditions and increasing consumption of imported luxuries such as confectionery. Chocolate candy from U.S.A. competes with that produced by local factories, and with boxed chocolates from the United Kingdom. Hard candies sold on the Colombian market are from the United States and European countries, chiefly United Kingdom. Most of the chewing gum comes from the United States. Imports of confectionery during 1926, the latest year for which statistics are available, were as follows, in pounds:

| Country of Origin. | Chocolate Confectionery. | Other Confectionery. | Chewing Gum. |
|---|---|---|---|
| United States | 29,691 | 1,151,187 | 30,928 |
| United Kingdom | 9,856 | 520,278 | 1,129 |
| France ... | 1,899 | 218,865 | 396 |
| Spain ... ... | 103 | 96,182 | — |
| Italy ... ... | 1,784 | 67,613 | 387 |
| Germany ... | 1,861 | 43,380 | — |
| Belgium ... | 17,417 | 8,265 | — |
| Switzerland ... | 862 | 574 | — |
| Ecuador ... | 11,594 | 3,698 | — |
| Others ... ... | 1,543 | 34,588 | — |
| Totals ... | 76,610 | 2,144,630 | 32,970 |

Imports of chocolates in 1927 were 94,569 lbs., imports of other confectionery totalled 2,713,381 lbs and chewing gum imports were 65,646 lbs.

## Peruvian Market for Confectionery.

There are about thirty manufacturers of biscuits chocolates, and candies in Peru, most of whom work on a small scale, making chiefly cheap chocolates and fruit-flavoured hard candies. The better varieties, including medicinal and aromatic lozenges, gum, fruit bon-bons, almond, chocolate, fruit, and milk candies, and toffees are sold loose or in glass jars and fancy packages. Peruvian production of confec-

tionery is estimated at 1,760,000 to 1,980,000 lbs., 70 per cent. of which is made in Lima. Production of chocolate is estimated at 2,760,000 lbs., 80 per cent. of which is manufactured in Lima.

Imports of confectionery during 1928 were as follows, in pounds:

| Country of Origin. | Confectionery in Common Containers. | Confectionery in Fancy Boxes. |
|---|---|---|
| United States ... | 378,322 | 22,505 |
| Italy ... ... | 147,228 | 6,695 |
| United Kingdom ... | 142,298 | 19,815 |
| Belgium ... | 122,351 | 11,931 |
| France ... | 68,360 | 3,119 |
| Germany ... | 34,674 | 3,036 |
| Holland ... | 8,302 | — |
| Spain ... | 2,758 | — |
| Others ... | 4,559 | — |
| Totals ... | 908,852 | 67,101 |

The Peruvian confectionery market is restricted to the narrow coastal belt, inhabited by that portion of the population which can afford imported confectionery. European manufacturers have had long connections with importers in Peru, hence these factors do not presage any considerable future increase in the sale of American confectionery. It is very difficult for concerns newly entering the Peruvian market to secure much business, due to the strong competition with other American and British, French and Italian manufacturers in this restricted market.

## Egyptian Market for Confectionery.

The Egyptian market is supplied by confectionery manufactured by a branch of the local industry catering to the native population, by another catering to resident foreigners, and with imported candies. Both branches of the local industry are reportedly prosperous, and the latter is expanding, due to the gradual Europeanisation of the natives. There are no statistics of production, since the industry comprises small factories and pastry shops in Cairo and Alexandria and scattered all over the country. Native confectionery consists chiefly of low quality caramels, fancy biscuits, "Basboussa" (made of coconut and honey), candy fresh apples, "Halawa," and similar articles. "Halawa" is very popular among the natives, one grade selling at about 4½d. per lb. and the other at 7d. The European type of confectioners make good quality chocolates, caramels, Turkish delights (Locoums), marrons glacés, toffees, etc. Most of the local manufacturers have their own sales rooms for wholesale and retail selling, and little machinery is used in the industry. Packing is by hand and fancy boxes and containers are imported. Egyptian made caramels, said to be successful imitations of imported grades, are usually packed in tins of 1, 2, and 3 kilograms (2·2, 4·4, and 6·6 lbs.), retailing at 6½d. to 9d. per lb. Toffees are usually packed in 2·2 lb. paper boxes, retailing at 9d. to 11d. per box. They are also packed in small paper bags, selling at 1d. to 2½d. each. Factory made chocolates in various types of packages retail at about 1s. 6d. per lb., while those wrapped in foil sell at 1s. 10½d. per lb. Assorted chocolates made in pastry shops sell at 2s. 10d. to 3s. 5d. per lb. Attractive packing and extensive advertising were factors in successful penetration of the Egyptian confectionery. These factors also acted to stimulate local demand for confectionery of all types. Imported confectionery is largely consumed by foreign residents and to a lesser extent by Europeanised natives. The quantities of imported confectionery during the past two years were as follows:

| Country of Origin. | 1928. | 1929. |
|---|---|---|
| | Lbs. | Lbs. |
| *Chocolate Confectionery:* | | |
| United Kingdom ... ... | 270,870 | 290,994 |
| Belgium ... ... ... | 631,047 | 896,124 |
| France ... ... ... | 203,443 | 228,101 |
| Germany ... ... ... | 12,844 | 9,266 |
| Holland ... ... ... | 145,213 | 150,537 |
| Italy ... ... ... | 130,911 | 156,879 |
| Switzerland ... ... | 261,926 | 290,926 |
| Other Countries ... ... | 14,063 | 6,761 |
| Totals ... ... ... | 1,670,317 | 2,029,588 |
| *Other Confectionery:* | | |
| United Kingdom ... ... | 442,090 | 469,650 |
| Austria ... ... ... | 113,744 | 105,602 |
| Belgium ... ... ... | 212,466 | 282,103 |
| France ... ... ... | 340,794 | 288,992 |
| Germany ... ... ... | 10,256 | 15,280 |
| Holland ... ... ... | 375,904 | 416,766 |
| Italy ... ... ... | 39,822 | 42,725 |
| Palestine ... ... ... | 4,096 | 2,749 |
| Switzerland ... ... | 5,657 | 7,169 |
| Syria ... ... ... | 23,380 | 22,919 |
| United States ... ... | 65,655 | 88,142 |
| Other Countries ... ... | 51,451 | 34,259 |
| Totals ... ... ... | 1,685,405 | 1,776,356 |

## German Butter Imports.

During the last six years the imports of foreign butters into Germany have progressed as follows:

| *Year.* | *Tons.* | *Value in Million Marks.* |
|---|---|---|
| 1923 ... ... | 1,250 | 2,7 |
| 1924 ... ... | 53,450 | 117,1 |
| 1925 ... ... | 96,475 | 371,1 |
| 1926 ... ... | 97,669 | 329,5 |
| 1927 ... ... | 108,179 | 365,4 |
| 1928 ... ... | 126,600 | 435,0 |

**FOOD MANUFACTURE is sent to any address in the World for 10s. per annum. Send your subscription now to LEONARD HILL, LTD., Thanet House, 231-2, Strand, London, W.C.2.**

# Trade News

The 33rd Universal Cookery and Food Exhibition will be held at Olympia from January 14 to 24, 1931. Application for particulars should be made to Drury House, Russell Street, London, W.C. 2.

* * *

We have received from The Drayton Regulator and Instrument Co., Ltd., leaflets describing their Heavy Duty Industrial Steam Trap, Differential Steam Trap, The "Union" Portable Gas Colorimeter, and Float Operated Electric Switches.

* * *

We have received from The Cellophane Company, Ltd., a leaflet giving some useful and interesting points in connection with the use of Cellophane for wrapping foodstuffs. It is pointed out that Cellophane help to sell more goods and that it protects and beautifies. The large variety of ways in which it can be used in the provision, confectionery, fish, sausage, and biscuit trades are dealt with in the leaflet.

* * *

G. H. Williamson and Sons, Ltd., of Worcester, have a scheme in operation whereby customers are loaned at a nominal rental either automatic or semi-automatic machines for seaming cans. This obviates the necessity for a large capital expenditure by the user of the cans, and ensures that the machines are kept in good working order.

* * *

The Dutch Government has given its consent to the N. V. de Nederlandsche Sojameel Fabriek (Netherlands Soya Flour Factory) at Amsterdam to manufacture and sell under the name of "Soya Bread" a bread consisting of 22 per cent. soya bean flour conserved according to the Berczeller method and 78 per cent. of wheat flour.

The consent has been given on condition that only a very small quantity of seed may be contained in the soya bean flour and that the bread must answer the prescriptions of the Dutch bread decree with the exception of ash content, which in the case of soya bread may not exceed 2 per cent.

* * *

We are informed that Mr. J. G. Jackson, of Glasgow, has returned to private consulting practice after having perfected a new process and machine for continuously mixing powders and plastics. Mr. Jackson has invented several types of filling and weighing machines.

* * *

A new method of packing chicken in glass containers is being introduced by Kingan and Company, Indianapolis. A widespread newspaper advertising campaign will start soon.

The chicken is covered with gelatine—the net weight of all for a three-pound chicken averaging three pounds six ounces. The gelatine may be used for soup, bouillon, or jelly. National distribution is being developed by the company through grocery and department store channels.

The new container tends to intensify competition between promoters of tin and glass containers.

* * *

In connection with the Bakers' and Confectioners' Exhibition and Market, Royal Agricultural Hall, London, September 6 to 12, the Exhibition Authorities announce that they have received from the Industrial Property Department of the Board of Trade a certificate under the provisions of the Patents and Designs Acts, 1907 to 1928, certifying the exhibition as an industrial exhibition for the purposes of the Acts. This will protect the exhibitors showing an invention at this exhibition, subject to certain conditions, such as giving notice of intention of exhibiting the invention and applying for a patent within six months from the date of the opening of the exhibition.

* * *

The Canners' and Allied Trades' Exhibition will be held at Leicester from October 24 to November 1, 1930. This date marks the close of the 1930 canning season. During the course of the exhibition the National Food Canning Council will hold its Fourth Annual Convention. Also, the exhibition is being held in conjunction with, and in the same building as, the Imperial Fruit Show. For full particulars, application should be made to the National Food Canning Council, 46, Charing Cross, London, S.W. 1.

### Standard Cost Accounting.

Rationalisation and the alteration of modern factory production methods have caused many business men to investigate the objects to be attained by a cost system, and, in cases where the present system of job or production costing is in vogue, to see if a more economical and efficient method could be installed.

Considerable interest is now being shown in the comparatively new idea of Standard Cost Accounting, out of which costs and efficiency records are obtained, besides providing for reconciliation with the financial books and the preparation of an operating statement showing the monthly loss or gain in trading, without the expense of obtaining detailed costs.

Briefly, Standard Cost Accounting can be described as a system to record:

1. The actual cost of production as related to the Standard or fixed cost.
2. Efficiency of labour.
3. The amount of economy in consumption of material.
4. The efficient use of machinery and equipment employed in production.

Standard costs need only be prepared once, and may be used to record in groups of related products or sizes if necessary.

The present system of retrospective costs have many disadvantages, besides which it entails in many instances a large and expensive staff, but on the standard method, costs can be provided with the minimum of staff and the maximum results. The demands of the executive and factory manager are met by providing means which are an aid to daily production, and not the presentation of historical facts too late to apply any remedy.

Expert opinion is given that Standard Cost Accounting will be adopted by the majority of manufacturers in the very near future.

Standard Cost Accounting furnishes records indicating the position of the business, the rate of progress of manufacture, the efficiency of production, and, most important of all, the deviation from the profit-earning figure and the reason for the variance, together with the reserves of power available to enable advantage to be taken of changing market conditions.

Standard Costing:

1. Constantly shows the efficiency of the factory with a predetermined standard.
2. Promptly discloses variances in actual, from expected costs.
3. Provides an efficient control on factory expenses and shows divergences from standard, and the causes.
4. All the needful information to maintain success in a business is provided.

A uniform system cannot be formulated universally; it is therefore necessary for the design and installation to be carried out by those skilled in this particular work if a successful system is to be the result.

Standard Cost Accounting not only reduces clerical staff, but is admirably adapted to the full use of labour saving of office machinery.

### The Value of Registered Trade Marks.

The following notes have been prepared by Messrs. Rayner and Co., Registered Patent and Trade Mark Agents, who are prepared to give readers free advice and information on the subject.

The importance of using brands and trade marks will no doubt appeal to every section of industry, but it certainly has a special interest to the trades embracing "Manufactured Food" in all its branches, and this is particularly exampled by the very large number of registrations in this "class" of goods at H.M.'s Patent Office.

A glimpse into the advertisement pages of FOOD MANUFACTURE will further prove the value of distinctive trade marks to this industry, and will show giant concerns such as Hovis, Quaker Oats, Bovril, Glaxo, and hundreds of others whose business has been built up on and firmly secured by individual trade marks.

No wise business man would start an advertising campaign without first obtaining good registered marks with which to brand his goods and secure his trade from fraud and imitation.

A registered trade mark is now fully recognised as a guarantee of the quality of the goods sold, for every purchaser will understand that no manufacturer would be so foolish as to put out inferior goods under his own branded mark which would very promptly ruin his business.

A branded mark also assures the maker that the public will know how to ask for the goods which have been found satisfactory, and so return orders are certain to come back to the manufacturer who owns the mark and not to others who have no marks, and it is always the return orders that prove the real success of any line of business.

The American cattle man brands his animals with his own mark before they are sent out on the plains, so that they may be known as his property and cannot be gathered in by others, and the same principle

applies to every trader, who should have his own registered mark upon all his goods, and this mark will continue to advertise these goods long after they have left his works, so that there will be no possible doubt but that they are of his manufacture.

It is now fully recognised that registered trade marks rank very high in the value of the goodwill of any business, and any money expended on these marked goods continue to increase the value of this goodwill.

Unregistered marks are dangerous, for the assets of a business are only those which are legally owned, and if you brand your goods with a mark that is public property it is of no value to your goodwill. It is therefore necessary to obtain a distinctive mark under which you may trade with security, for if the goodwill of the business is vested in unregistered marks the position is as dangerous as leaving the "factory" unlocked or the door of the "safe" open.

There is a proverb which says that "a good name is rather to be desired than riches," and this is particularly applicable to brands and trade marks, which may be looked upon as a kind of "passport" which permits only satisfactory characters to pass from one country to another, and such a "passport" in trade would be a guarantee of reliability and fitness of the product on which the mark is branded.

The cost to obtain registration of marks is very small in proportion to their value, and they last practically for all time, with only a small fee every fourteen years. They are the cheapest form of insurance against fraud and imitation, and should never be neglected by traders.

It should also be remembered that both foreign and Colonial trade marks can be obtained, and when any export business is going forward the Colonial marks are especially valuable to the home manufacturers. They would greatly assist in competing with foreign traders, and the position of a registered trade mark overseas is of the highest importance in assuring a first-class agent to handle the goods under the guarantee, as then they can only be obtained through such a sole agent.

Foreign marks are also often very desirable to prevent inferior goods being sold by others in a foreign country under a British mark, thereby doing great injury to the reputation of the British manufacturer and also resulting in a great loss of trade.

The trade mark is not so easy to obtain as some may think from the Trade Mark Department of H.M. Patent Office, as considerable expert and technical knowledge is required, together with long experience, to steer the application to a successful issue; but when one is granted it will gradually grow in importance and value until, if well exploited, it will be one of the most valuable assets in the business.

### Hydrogen-ion Measurement in Food Industries.

We have received from the Cambridge Instrument Company, Ltd., a booklet (List No. 108) giving a great deal of useful information on the methods and instruments used in the practical determination of hydrogen-ion concentration for control of industrial operations. In an interesting Introduction it is pointed out that many industrial chemists have hesitated to adopt the electrometric method of analysis owing to a mistaken impression that it is too difficult and complicated for a works laboratory. However, apparatus is now available whereby the accurate determination of hydrogen-ion concentrations (pH) becomes a comparatively simple matter; the simpler outfits designed for general industrial purposes can be used by non-technical men for routine measurements after a little training. The various forms of apparatus described in the booklet cover practically every industrial or scientific application. The list of industrial applications is an extraordinary one and appears to embrace nearly every branch of activity. Selecting those of interest to readers, one may instance flour-milling and baking, in which the pH value of flour and dough has an important effect upon the quality of the bread—*e.g.*, the loaf volume, texture, colour, and formation of "rope." It has been found that the best results are usually obtained with dough having a pH of about 4·7 to 5·0.

In the manufacture of fruit jellies, jams, and marmalades, the formation of jelly is affected by the pH value. The gelation optimum of pectin is 3·0 and the optimum of pectase 4·3 pH; some investigators have obtained maximum jelly yield by extracting the pectin at 2·15 pH; The sterilisation of canned foods (fruit, tomatoes, vegetables, and meats) is largely influenced by the pH, which also affects the flavour of the foods. For further information, reference may be made to: W. D. Bigelow and P. H. Cathcart, "Relation of Processing to the Acidity of Canned Foods," *Research Lab. Natl. Canners' Assn.*, Washington, U.S.A., Bulletin 17-L (1921); H. Lüers and K. Lochmüller, "Die messung der gelierkraft von fruchtpektinen," *Kolloid- Z.*, vol. 42, p. 154 (1927); P. B. Myers and G. L. Baker, "Fruit Jellies: VI. The Rôle of Pectin and the Extraction of Pectin from Pectin Materials," *Delaware Agr Exptl. Sta.*, Bull. 160 (1929).

The keeping quality and other properties of milk depend, among other things, upon the hydrogen-ion concentration. Normal fresh milk has a pH of about 6·5 to 6·65; with increasing pH there is a tendency for the specific gravity to decrease. By adding lemon juice to adjust the pH value of cow's milk to about 5·5, it is made more easily digestible by infants. The addition of hydrochloric acid to sour cream, reducing to pH 3·0, enables milk fat to be easily separated. pH control is also of value in the manufacture of cheese.

The viscosity, solubility, jelly-strength, melting point, water-absorption, etc., of glues and gelatines are largely affected by variations in the pH value. The electrometric method is particularly suitable for this application. A glue having a pH value of about 7 has been found to possess good adhesive qualities.

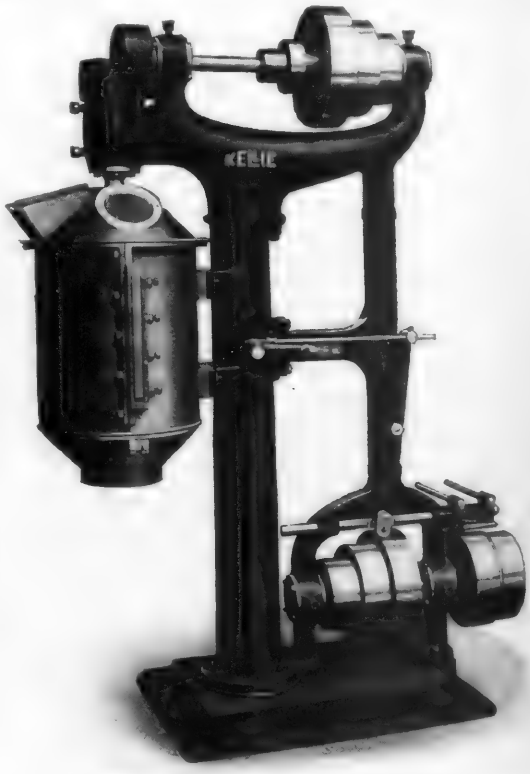
Each ingredient of beer has its own effect on the acidity, and, generally, the pH value at each stage in the production should be distinctly on the acid side. On the other hand, too great acidity is detrimental. It has been found by repeated experiments that pH values of 5·2 in the mash tun, 5·0 in the copper, and 4·2 in fermentation produce satisfactory results.

Clarification, colloidal precipitation, colour and inversion of sucrose in cane sugar manufacture are largely governed by the hydrogen-ion concentration. Much wastage can be prevented by pH control. (A useful pH chart is given on page 399 of Dr. Britton's book.) In beet sugar manufacture it is also advisable to control the pH of the liquors throughout the process of clarification, in order to secure the elimination of impurities. By controlling the pH of the pan liquors between (say) 7·0 and 8·5 pH, improved boiling operations and better quality of sugar may be obtained.

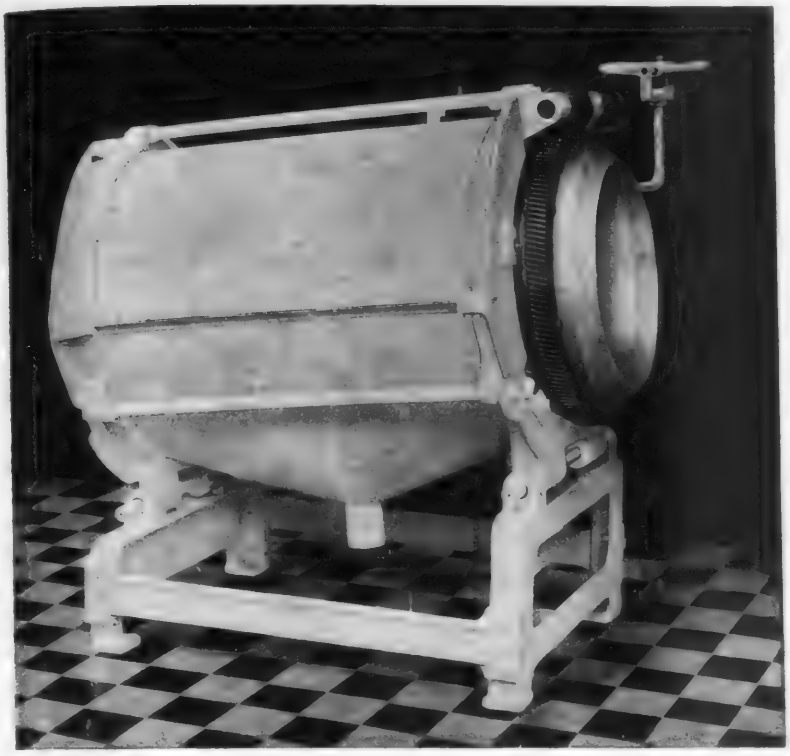
The acidity of the medium is a condition of vital importance in the study of bacteriological processes, and the control of the pH in the preparation of culture media is now considered essential by many investigators. Such control not only keeps the medium favourable for growth of the culture, but also maintains the nutritive value of the food substances. Actual figures of pH values cannot be given, since the pH for optimum growth varies widely with the different media and bacteria. This variation, however, enables pH control to be employed in the isolation of pure cultures. The hydrogen-ion concentration is also of importance in investigations of the disinfectant action of acids and bases, in bacterial metabolism, in testing fermentation and in tests with vaccine virus.

### Two Fruit Cutting Machines.

The Kellie Horizontal Continuous Cutting Machine is specially arranged to cut all stone fruits, in addition to apples. It is also extensively used for bursting black currants for clarified jelly preserves. The principle incorporated is a very simple one, consisting essentially of a heavy balanced phosphor bronze drum




**The Kellie Vertical Cutting Machine.**



**The A.P.V. Jam Cooling Machine.**

rotating at a high speed; at intervals around the periphery of the drum are fitted a series of longitudinal composite steel knives; phosphor bronze pivoted and spring adjusted back plates abut against the rotating drum and the knives, the fruit thereby being smashed to a pulp and a large proportion of the stones broken by the peculiar wedging action which is developed between the backing plates and the drum. This machine is fitted with heavy duty ball bearings throughout and is complete with overhead countershaft.

The Kellie Vertical Continuous High Speed Cutting Machine, is illustrated on page 174. Originally designed as a unit of the Kellie-Yates Juice Filtration Plants it deals efficiently with all stoneless fruits, such as apples, oranges, lemons, etc.; in addition, it is claimed to be the only machine which will cut the whites (or the pith) of orange and lemon peel as produced by the peel stripping and shredding machines. It yields excellent results on tomatoes and similar work. This machine is fitted throughout with ball bearings, and is provided with phosphor bronze machined cutting cylinder made in halves to permit of ready adjustment of the phosphor bronze combs and the stainless steel revolving cutters, which are mounted spirally. Aluminium feed and delivery hoppers with inspection glass are provided and the machine is complete with 3-speed cone drive and interlocked belt striking gear, also safety shearing device to prevent breakage of the cutters should they meet with any obstruction.

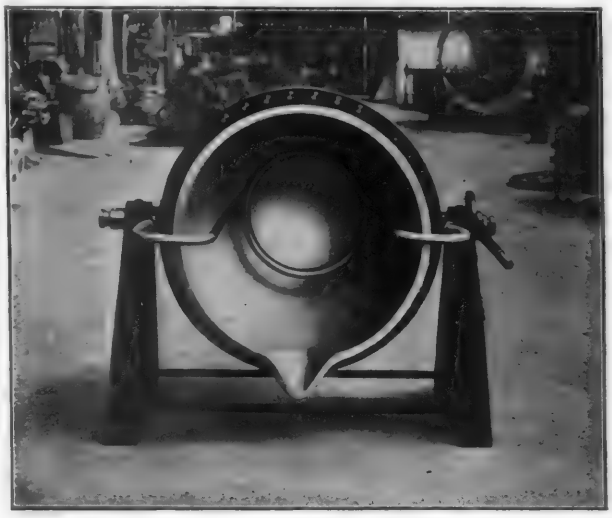
### A Jam Cooling Machine.

The process of cooling has always been a particularly difficult problem for the manufacturer, especially in the case of strawberry, plum, and all stone fruit, since they must be cooled rapidly to prevent the whole fruit floating or the plum stones rising to the top of the jars; also, bruising of the fruit must be avoided, and no "beadiness" or aeration must be apparent as this "clouds" the jam after potting.

The A.P.V. Continuous Rotary Jam Cooler (here illustrated) claims to effect cooling in compliance with the above requirements. Essentially it consists of an inclined, stainless steel cylinder which revolves very slowly. The jam is fed into one end of this cylinder, while sprays of water play on the outside of it. The jam finds its way to the lower end of the cylinder, where it is delivered cooled. The rate and degree of cooling are adjusted by the flow of cooling water. As an example of performance, it is stated that a test gave: 120 lbs. of strawberry jam cooled from 215° F. to 170° F. in 1¾ minutes, using cooling water (50° F.) at the rate of 5 gallons per minute. The machine also appears to be well adapted for cooling pulp.

### Boiling Pans for Jam, etc.

The two accompanying illustrations are photographs of the standard type of steam jacketed tilting Food Boiling Pan built by the Birmal Chemical Engineers. This pan is constructed in Birmabright Alloy, which has proved eminently satisfactory for the handling of foodstuffs such as jams, fruit juices, and others of an acid or slightly alkaline nature. This firm constructs pans for high pressure and high temperature working and are supplied with or without the addition of the extra coil as shown in the photographs.



**The Birmal Boiling Pans for Jam, etc.**

# New Companies

SOMERS HARDWICK, LIMITED. (247358.) 2, The Pavement, Grove Road, Sutton. To carry on the bus. of restaurant, café, and refreshment-room proprs., etc. Nom. Cap.: £2,000 in £1 shares.

LAWRENCE J. BETTS, LIMITED. (247405.) Invicta House, Pudding Lane, Maidstone. To acquire and carry on farming businesses at West Malling, Kent, and elsewhere. Nom. Cap.: £500 in £1 shares.

S.I.E.P.A., LIMITED. (247329.) To take over the bus. of S.I.E.P.A., cd. on at 24, Southwark St., S.E., and to carry on the bus. of fruit, vegetable, and flower salesmen, etc. Nom. Cap.: £200 in £1 shares.

YEOVIL EGG PACKING AND PRODUCE CO-OPERATING COMPANY, LIMITED. (247339.) To take over the bus. cd. on at South St., Yeovil, as "The Yeovil Egg Packing Company." Nom. Cap.: £2,000 in £1 shares.

PRITCHARD AND ELSON, LIMITED. (247326.) 3, Stanley Street, Liverpool. To take over the bus. of butchers cd. on at Liverpool as "Pritchard and Elson." Nom. Cap.: £5,000 in £1 shares.

J. GREEN AND COMPANY (WALES), LIMITED. (247404.) Griffin Yard, Caerleon Road, Newport, Mon. To take over the bus. of a flour mcht. and vendor in Wales and Monmouth cd. on at Newport by J. F. Green. Nom. Cap.: £800 in £1 shares.

E. SIDDLE AND SONS, LIMITED. (247399.) 273, Tong Street, Bradford. To carry on the bus. of provision and genl. mchts., grocers, etc. Nom. Cap.: £1,000 in £1 shares.

H. AND K. BETTS, LIMITED. (247403.) Invicta House, Pudding Lane, Maidstone. To acquire and carry on farming businesses at Otham, Kent, and elsewhere. Nom. Cap.: £500 in £1 shares.

YORK WINE STORES, LIMITED. (247396.) 52b, High Street, Southend-on-Sea. To take over the bus. of a wine and spirit mcht. and caterer cd. on in Southend-on-Sea by L. Bertorelli. Nom. Cap.: £2,000 in £1 shares.

THREE COUNTIES (SOMERSET, WILTS, AND DORSET) FARM PRODUCE AGENCY, LIMITED. (247343.) To carry on bus. as indicated by the title. Nom. Cap.: £2,000 in £10 shares.

BROCKLEHURST'S COOKED MEATS, LIMITED. (247747.) 37, Chestergate, Macclesfield. To carry on bus. as pie makers, etc. Nom. Cap.: £500 in £1 shares.

MALMAISON, LIMITED. (247902.) Eldon Street House, Eldon Street, E.C.2. To carry on the bus. of hotel and café proprs., etc. Nom. Cap.: £30,000 in 29,900 ord. shares of £1 and 2,000 deferred shares of 1s. each.

BOOTH'S BOROUGH BAKERY, LIMITED. (247841.) Elizabeth Street, Salford, Lancs. To take over the bus. of a wholesale and retail baker and confectioner cd. on at Salford as "Booth's Borough Bakery." Nom. Cap.: £3,500 in £1 shares.

LAWRENCE BROTHERS (BILLINGSGATE), LIMITED. (247933.) 29, Monument Street, E.C.3. To carry on the bus. of wholesale mchts. of fish, etc. Nom. Cap.: £4,000 in £1 shares (3,000 "A" and 1,000 "B").

PICARDS, LIMITED. (247804.) 10 and 12, Heddon Street, W.1. To take over the bus. of Picards, Ltd., of 119, Regent St., W., and to carry on the bus. of dlrs. in and roasters of coffee. Nom. Cap.: £5,000 in £1 shares.

CHARLES WHITE (LIVERPOOL), LIMITED. (247693.) 8, Queen Square, Liverpool. To carry on the bus. of fruit mchts. formerly cd. on at Liverpool as Charles White. Nom. Cap.: £5,000 in £1 shares.

KENYA SUGAR COMPANY, LIMITED. (247822.) 7, John Street, Adelphi, W.C. To carry on the bus. of planters and refiners of and dlrs. in sugar, etc. Nom. Cap.: £100 in £1 shares.

BEVAERATORS, LIMITED. (247778.) 31, King William Street, E.C.4. To carry on the bus. of mnfrs. and purveyors of and dlrs. in syrups, cordials, and other liquids, etc. Nom. Cap.: £500 in 1,200 "A" shares of 2s. 6d. and 350 "B" shares of £1.

J. AND A. CARPENTER, LIMITED. (247797.) 11 and 12, Sutherland Place, S.E.17. To take over the bus. of J. and A. Carpenter, Ltd. (in voluntary liquidation), and to carry on the bus. of preserve and provn. mchts., etc. Nom. Cap.: £15,000 in £1 shares.

STREET AND SONS, LIMITED. (247795.) To take over the bus. of a baker, grocer, and provision mcht. cd. on at Southampton St., Ringwood, Hants., as "Street and Sons." Nom. Cap.: £3,000 in £1 shares.

LYDNEY MINERAL WATER CO., LIMITED. (247855.) To carry on the bus. of mnfrs. of and dlrs. in aerated and mineral waters, etc. Nom. Cap.: £1,500 in £1 shares.

JAMES INCE AND SONS, LIMITED. (247821.) To take over the bus. of grocers and bakers cd. on at 74, Newton Rd., Lowton St. Mary's, by J. Ince and Sons. Nom. Cap.: £1,000 in £1 shares.

CRYSTAL SPRING TABLE WATER CO., LIMITED. (247844.) To carry on the bus. of mnfrs. of and dlrs. in mineral and aerated waters, etc. Nom. Cap.: £500 in £1 shares.

FOORD BROS., LIMITED. (247541.) To carry on the bus. of mnfrs. of and dlrs. in mineral, distilled, and aerated waters, etc. Nom. Cap.: £1,000 in £1 shares.

MACGREGOR FISHERIES, LIMITED. (247488.) 4, Longden Street, Nottingham. To carry on bus. as indicated by the title. Nom. Cap.: £100 in £1 shares.

CADER AERATED WATERS, LIMITED. (247535.) The Old Brewery, Dolgelley, Merioneth. To take over the bus. of mineral water mnfrs. cd. on at Dolgelley by Cader Table Waters, Ltd. Nom. Cap.: £2,000 in £1 shares.

LATCHAM, LIMITED. (247487.) 11, Highbury Park, N.5. To carry on the bus. of grocers and provision mchts., etc. Nom. Cap.: £750 in £1 shares.

WILLIAM WHITE (PROVISION MERCHANT AND CONFECTIONER), LIMITED. (247558.) 24, Clayton Road, Newcastle-on-Tyne. To take over the bus. of a grocer and provision mcht., etc., cd. on at Newcastle-on-Tyne as William White. Nom. Cap.: £5,000 in £1 shares.

E.R.C.I., LIMITED. (247476.) Copthall House, Copthall Avenue, E.C.2. To acquire the sole and exclusive rights to mnfr. and sell in Great Britain, Ireland, Europe, and Australia the product known as Blue Seal Egg Replacer and Cake Improver, etc. Nom. Cap.: £16,000 in 2,000 ord. and 14,000 pref. shares of £1 each.

RICHARDSON BROTHERS, LIMITED. (247767.) The Brewery, Mason Street, Normanby, Eston, Yorks. To take over the bus. cd. on at Normanby as Richardson Brothers; and to carry on the bus. of brewers, etc. Nom. Cap.: £5,000 in £1 shares.

BROOKS GREEN COMMERCIAL EGG FARM, LIMITED. (247711.) "Oakhurst," Brooks Green, Horsham, Sussex. To carry on the bus. of poultry farmers, egg mchts. etc. Nom. Cap.: £2,000 in £1 shares.

A. J. PHIPPEN, LIMITED. (247760.) To take over the bus. of a wholesale grocer and provision mcht. cd. on at 77-79, Victoria St., Bristol, by Alfred J. Phippen. Nom. Cap.: £30,000 in £1 shares (7,000 pref. and 23,000 ord.).

GORDONS (BOURNEMOUTH), LIMITED. (247721.) Richmond Chambers, The Square, Bournemouth. To take over the bus. of fruiterers, greengrocers, and florists cd. on at 35 and 224, Old Christchurch Rd., Bournemouth, as "Gordons." Nom. Cap.: £4,000 in £1 shares.

FRUIT EXTRACTS, LIMITED. (247719.) To carry on the bus. of mnfrs. of and dlrs. in health foods, fruit extracts. Nom. Cap.: £1,000 in £1 shares.

## London Gazette Information

### MERCHANDISE MARKS ACT, 1926

*Cardboard Boxes, etc.*

With reference to the notice which was published in the London, Edinburgh, and Belfast Gazettes of May 17, 1929, regarding a reference made by the Board of Trade to the Standing Committee under the Merchandise Marks Act, 1926, in respect of the following descriptions of imported goods:

(i.) Boxes, cartons, cases, and other containers made of paper, chip, cardboard, strawboard, fibreboard, pulpboard, or similar boxboards, or of a combination of these materials, whether corrugated or not, other than paper bags, suitcases, attaché cases, or similar cases;

(ii.) Flats for boxes, cartons, cases, and other containers of the descriptions specified in paragraph (i.),

the Board of Trade give notice that a Report has been made by the Committee in respect of the aforesaid classes and descriptions of goods.

The Report is being published and may shortly be obtained from H.M. Stationery Offices.

*Imported Malt Products.*

The draft of an Order in Council to require imported malt products to be marked with an indication of origin in accordance with the Merchandise Marks Act, 1926, has been laid before Parliament as required by Sec. 7 of the Act.

The text of the draft Order in Council appears in the Board of Trade Journal of May 1, 1930, and copies of the draft Order can be obtained from H.M. Stationery Office.

### TRADE BOARDS ACTS, 1909 AND 1918

*Keg and Drum Trade Board (Great Britain).*

Fixing of Overtime Rates of Wages for Time Workers for Sundays and "Trade Holidays."

The Keg and Drum Trade Board (Great Britain) have issued a notice dated May 13, 1930, setting out Overtime Rates of Wages for Time Workers for Sundays and "Trade Holidays" as fixed by the Trade Board and confirmed by Order of the Minister of Labour to take effect as from May 19, 1930, together with the Minimum Rates which were previously in operation.

Full particulars of these rates may be obtained from the Secretary, Keg and Drum Trade Board (Great Britain), 1, Whitehall Gardens, S.W.1.

# Financial News

*The Editor cannot accept responsibility for any errors which may appear in the Financial News Section.*

## BANK RATE (1929-1930)

| 1929. | | 1930. | |
|---|---|---|---|
| Feb. 7 | 5½ per cent. | Feb. 6 | 4½ per cent. |
| Sept. 26 | 6½ ,, ,, | Mar. 6 | 4 ,, ,, |
| Oct. 31 | 6 ,, ,, | ,, 20 | 3½ ,, ,, |
| Nov. 21 | 5½ ,, ,, | May 1 | 3 ,, ,, |
| Dec. 12 | 5 ,, ,, | | |

As a consequence of the high monetary rates and the decline in general purchasing power during 1929, the financial results of many concerns in the food industry are not as satisfactory as would have been the case if cheaper money and extended trade credit facilities had been available. The special features of the 1929 accounts of certain companies, whose final figures have already been submitted, are shown below:

* * *

The products of BOVRIL, LTD., were in excess of any previous year's turnover, and the trading profit after taking credit for other income amounted to £677,137 as compared with £637,057 for the 1928 financial period, or an increase of £40,080. The general expenses and the interest charges were higher, however, and only £12,295 of the increase in gross profit is reflected in the net profit, which was £329,820 as compared with £317,525. As the sum of £71,135 was brought forward from the previous accounts, the disposable balance was £400,955, and this amount was allocated as follows:

| | £ |
|---|---|
| 6% dividend on £1,000,000 Cumulative Preference Shares | 60,000 |
| 7½% dividend on £1,000,000 Ordinary Shares ... ... | 75,000 |
| 13% dividend on £1,000,000 Deferred Shares ... ... | 130,000 |
| Transferred to Reserve ... ... ... ... ... | 60,000 |
| Carried forward to 1930 Appropriation ... ... ... | 75,955 |
| | £400,955 |

The principal items on the company's balance sheet are:

| | £ |
|---|---|
| Goodwill and Trade Marks ... ... ... | 2,414,323 |
| Reserve Fund ... ... ... ... ... | 1,220,000 |
| Stock (Cattle, Products, and Materials) ... ... | 1,763,769 |
| Sundry Debtors ... ... ... ... ... | 896,830 |
| Creditors ... ... ... ... ... ... | 595,556 |
| Cash ... ... ... ... ... ... | 252,405 |
| Freeholds and Leaseholds ... ... ... | 241,508 |
| Investments (including Interests in Associated Companies) ... ... ... ... ... | 373,135 |
| Interests in Subsidiary Companies ... ... ... | 204,552 |
| Plant and Furniture ... ... ... ... | 40,755 |
| Stock of Advertising Material ... ... ... | 8,234 |

At 82½ the 4½% debenture stock yields 5½%, and at 22/- the 6% preference shares also return 5½%. The ordinary shares at 24/- yield 6¼%, and at 40/- the deferred return 6¾%.

In July, 1929, KIA-ORA, LTD., was registered for the purpose of acquiring the assets and the undertaking of similar name which had been incorporated in Australia, including the right to manufacture and sell Kia-Ora fruit juices throughout the world (with certain exceptions). The authorised capital of the company is £500,000 in shares of 10/- each, of which £410,000 has been issued and paid up, and the first accounts are a little disappointing. After debiting depreciation and certain Australian expenses, the profit for the year amounted to £62,278 subject to income tax and directors' fees and interest payable to the vendors, the latter figure being £24,644. The net profit was £25,950, but as £19,667 was earned prior to the incorporation of the company, the disposable balance was only £6,282 which was dealt with by writing £1,282 off the book value of the goodwill and carrying forward £5,000 to the current year. The value of the goodwill is stated to be £290,000, and investments assessed at cost price total £6,000.

The profit realised by LIEBIG'S EXTRACT OF MEAT CO., LTD., during the last financial year amounted to £371,125, which is an increase of £26,262 when compared with the results for the previous twelve months. To this profit should be added the balance brought forward from the 1928 accounts, viz. £255,824, giving a total of £626,949, which was divided as follows:

| | £ |
|---|---|
| 5% Preference Dividend ... ... ... ... | 50,000 |
| 16% Ordinary Dividend ... ... ... ... | 320,000 |
| Carried forward to 1930 ... ... ... ... | 256,949 |
| | £626,949 |

Some of the principal items in the balance sheet are:

| | £ |
|---|---|
| Subsidiary Companies (Investments and Net Balances) | 1,999,385 |
| Land, Plant, etc. ... ... ... ... ... | 435,045 |
| Cash ... ... ... ... ... ... ... | 199,947 |
| Debtors ... ... ... ... ... ... ... | 205,321 |
| Creditors (including Bank Advances) ... ... ... | 735,074 |
| Bills Payable ... ... ... ... ... ... | 550,000 |
| Employees Fund ... ... ... ... ... | 102,631 |

The company owns estancias and factories in South America, ranches in South-West Africa and Rhodesia, and the London and Antwerp factories. The share capital consists of £1,000,000 5% cumulative preference shares of £5 each, and £2,000,000 in ordinary shares of £5 each, the latter having been increased by £500,000 since the 1928 balancing. At 95/- the preference yield £5 5 3%, while the ordinary shares at the recent price of 16¼ return nearly 5%. The company's stock as at August 31 last was assessed at £3,645,790, which compares with £2,874,747 at August 31, 1928.

The profit and loss account of W. HILL AND SON, LTD., the catering company which acquired CABINS (1917), LTD., from the A.B.C., LTD., in 1928, shows a net profit of £3,602 for the year ended December 31 last as compared with £13,729 realised the previous year. The decline was due, in the main, to a larger debit under the heading of depreciation, and after adding the sum brought in from the 1928 accounts, viz. £7072, there was not a balance sufficient to pay the second half-year's preference dividend. The preference dividend for the half-year ended June 30, 1929, absorbed £7,500, leaving a credit balance of £3,174, but owing to a loss of £17,151 resulting from the realisation of an investment and another loss of £963 on properties and plant, a debit balance of £14,940 has been brought into the 1930 account. Recently the preference shares were quoted at ¾, and the ordinary at ⅛. Although £30,552 was owing to creditors, the cash balance was £32,979, and £10,483 was due from sundry debtors while the stock was assessed at £7,397.

The results of the ENGLISH MARGARINE WORKS, LTD., for the last two years are compared below:

ENGLISH MARGARINE WORKS, LTD.

| | *Dec.* 31, 1929. | *Dec.* 31, 1928. |
|---|---|---|
| | £ | £ |
| Profit ... ... ... ... ... | 133,039 | 106,282 |
| Reserve and Depreciation ... ... | 22,695 | 41,543 |
| Taxes and Directors' Fees ... ... | 14,233 | 22,750 |
| Preference Dividend 7% (less tax) ... | 28,000 | 28,000 |
| Ordinary Dividend 8% ( ,, ) ... | 32,000 | 32,000 |
| Pension Fund Establishment Costs (Balance written off) ... ... ... ... | 26,000 | — |
| Creditors ... ... ... ... ... | 97,017 | 215,497 |
| Debtors ... ... ... ... ... | 336,742 | 407,137 |
| Stock ... ... ... ... ... | 91,641 | 87,986 |
| Cash ... ... ... ... ... | 56,564 | 61,354 |
| Properties, etc. ... ... ... ... | 435,581 | 417,935 |
| Investments, at Cost ... ... ... | 234,643 | 234,643 |
| Goodwill ... ... ... ... ... | 300,000 | 300,000 |
| Reserve for Depreciation ... ... | 187,517 | 152,780 |
| General Reserve ... ... ... ... | 100,000 | 100,000 |
| Participating Preference Shares ... | 500,000 | 500,000 |
| Ordinary Shares ... ... ... ... | 500,000 | 500,000 |
| Carried forward ... ... ... ... | 24,638 | 18,027 |

At 25/- the preference shares yield 5⅔%. The ordinary shares are held by Lovell and Christmas.

The accounts of J. and E. HALL, LTD., manufacturers of refrigerating machinery, and plant for the collection, compression and purification of $CO_2$ gas, show a net profit of £60,379 for the fourteen

months ended September 30 last, as compared with a profit of £57,056 for the previous twelve months. After adding the sum of £7,397 brought forward, the disposable balance was £67,776, enabling a dividend at the rate of 8½% to be paid on the ordinary shares, as before, and £9,676 carried forward to the current year's profit and loss account. The company's reserve stands at £250,000, and investments are valued at £112,853.

In 1925, H. P. SAUCE, LTD., was registered to acquire the business of the MIDLAND VINEGAR CO., LTD.—proprietors of F. G. GARTON AND CO., LTD., and the TOWER YEAST CO., LTD.—and the net profit realised from the manufacture of sauce, vinegar, yeast, and pickles during the year ended December, 1929, amounted to £159,526, being an increase of £6,354 compared with the 1928 figure. The amount brought into appropriation account was £44,480, giving a total of £204,006, which was divided as follows:

| | £ |
|---|---|
| 7% dividend on £260,007 Cumulative Preference Shares (less tax) | 14,560 |
| 30% dividend on £300,000 Ordinary Shares (less tax) | 72,000 |
| Depreciation in value of Investments | 9,443 |
| Transferred to Reserve | 60,000 |
| Carried forward | 48,003 |
| | £204,006 |

The capitalisation of £100,000 of the undivided profits has been approved, and an agreement for the amalgamation of the company with LEA AND PERRINS has been entered into. The general reserve shows a credit balance of £185,000, subject to adjustments. Recently the ordinary shares were quoted at 5¼ and the preference at 25/-.

Compared with the profit of £177,326 realised by CEREBOS, LTD., during 1928, the figure of £213,231 shown in the profit and loss account for the year ended November 30 last is a decided improvement. This amount has been allocated by payment of a dividend (tax free) of 30% on the £500,000 ordinary shares, absorbing £150,000, and by adding another £50,000 to reserve, enabling £13,231 to be added to the carry forward, which now amounts to £92,318. Liquid assets consist of cash £238,801, debtors £69,918, and stock £55,370, against creditors amounting to £152,737. At the recent price of 6¼ the shares yield 4¾%.

The continued progress of JOSEPH NATHAN AND CO., LTD.—the importers of New Zealand butter, cheese, and casein, and manufacturers of dried milk—is reflected in the accounts for the past year, which show a net profit of £65,378 compared with £61,217 for the 1928 financial year. The amount brought forward from the previous appropriation was £26,883, giving a disposable balance of £92,261, which was allocated in the following manner:

| | £ |
|---|---|
| 7% dividend on £500,000 Cumulative Preference Shares | 35,000 |
| 8% dividend on £200,000 Preferred Ordinary Shares | 16,000 |
| Provision for Income Tax | 4,000 |
| Transferred to Reserve | 5,000 |
| Carried forward | 32,261 |
| | £92,261 |

The principal items in the 1928 and 1929 accounts are compared below:

| | 1929. £ | 1928. £ |
|---|---|---|
| Debtors | 194,511 | 159,902 |
| Due to Bankers | 175,846 | 97,238 |
| Stocks | 218,937 | 225,482 |
| Cash | 60,811 | 31,624 |
| Creditors | 123,371 | 124,094 |
| Net Profit | 65,378 | 61,217 |
| Carried forward | 32,261 | 26,883 |

The amount due to bankers includes advances against produce in store, awaiting shipment, and afloat. There is still no dividend on the ordinary shares, which were recently quoted at 2/6. At 18/- the preference shares return 7⅞%, while the preferred shares, at 7/6, yield 10⅔%.

*(Continued from next column.)*

| | *May*, 1930. | *Par Value.* | *April*, 1930. |
|---|---|---|---|
| United Caterers: Ord. | 8/2 | 5/- | 8/- |
| United Dairies: Ord. | 31/4 | £1 | 30/- |
| 6% Pref. | 21/3 | £1 | 21/- |
| United Glass Bottle: Ord. | 24/- | £1 | 24/4 |
| United Molasses: Ord. | 3 13/16 | £1 | 5⅝ |

## FOOD INDUSTRY STOCK AND SHARE LIST.

| | *May*, 1930. | *Par Value.* | *April*, 1930. |
|---|---|---|---|
| Aerated Bread: Ord. | 19/3 | £1 | 19/7 |
| 6½% Pref. | 19/- | £1 | 20/- |
| Apollinaris: Ord. | 7/6 | £1 | 8/3 |
| Assoc. Biscuit: 6½% Pref. | 23/1 | £1 | 23/4 |
| Avery (W. and T.): Ord. | 53/3 | £1 | 55/6 |
| Bovril: Ord. | 23/9 | £1 | 24/1 |
| Deferred | 40/3 | £1 | 40/- |
| 6% Pref. | 21/6 | £1 | 22/- |
| 4½% Deb. | 85 | £100 | 84 |
| British Aluminium: Ord. | 44/- | £1 | 45/3 |
| 6% Pref. | 21/6 | £1 | 22/3 |
| British Thomson Houston: 7% Pref. | 24/- | £1 | 23/9 |
| Cadbury: 8% 2nd Pref. | 27/6 | £1 | 26/3 |
| Carrs: 6½% Pref. | 20/6 | £1 | 20/3 |
| Cerebos: Ord. | 6½ | £1 | 6¼ |
| Chivers: 6% Deb. | 99½ | £100 | 99½ |
| Cinzano: 7½% Pref. | 21/5 | £1 | 21/6 |
| Clark's Bread: Ord. | 20/10 | 10/- | 20/10 |
| Crosse and Blackwell: Ord. | 2/10 | 1/- | 3/2 |
| 7½% Pref. | 14/3 | 15/- | 13/10 |
| English Margarine: Pref. | 1¾ | £1 | 1⅛ |
| Foster Clark: Ord. | 49/9 | 10/- | 50/6 |
| Frys: 8% "B" Preferred | 21/10 | £1 | 21/10 |
| H.P. Sauce: Ord. | 5¼ | £1 | 5 |
| Hill (W.): Ord. | ⅝ | £1 | ⅝ |
| Home and Colonial: Ord. | 17/6 | 4/- | 17/7 |
| 15% Cum. Ord. | 52/6 | £1 | 50/- |
| 6% Cum. Pref. | 5 5/32 | £5 | 5⅛ |
| Hovis: 6% Cum. Pref. | 22/3 | £1 | 21/9 |
| Imperial Chemical: Ord. | 25/3 | £1 | 26/4 |
| Deferred | 7/8 | 10/- | 8/5 |
| 7% Cum. Pref. | 24/6 | £1 | 24/- |
| International Tea: Ord. | 24/2 | 5/- | 25/7 |
| 6% 1st Pref. | 21/9 | £1 | 21/6 |
| 7% "A" Pref. | 24/6 | £1 | 23/- |
| Liebigs: (Reg.) | 16¼ | £5 | 16 7/16 |
| (Bearer) | 16 1/16 | £5 | 16⅜ |
| 5% Pref. | 93/2 | £5 | 93/9 |
| Lipton: Ord. | 4/5 | 1/- | 5/1 |
| 5% 1st Pref. | 7/5 | 10/- | 7/10 |
| 6% Pref. | 8/3 | 10/- | 8/6 |
| 6% Deb. | 96 | £100 | 94 |
| Lyons: Ord. | 97/- | £1 | 99/3 |
| "A" Ord. | 95/- | £1 | 98/9 |
| 5% Pref. | 19/6 | £1 | 19/6 |
| 6% Pref. | 21/3 | £1 | 21/3 |
| 7% Pref. | 23/3 | £1 | 25/4 |
| 8% Pref. | 28/11 | £1 | 29/- |
| Maypole Dairy: 20% Preferred | 16/7 | 5/- | 16/3 |
| Deferred | 5/3 | 2/- | 5/4 |
| 5% Pref. | 19/6 | £1 | 19/9 |
| Meadow Dairy: 7½% Pref. | 24/4 | £1 | 23/10 |
| Nathan (J.): Ord. | 2/6 | 1/- | 2/4 |
| 7% Pref. | 18/- | £1 | 16/9 |
| 8% Preferred | 7/6 | 10/- | 7/1 |
| Nestlés: 8% Pref. | 29/2 | £1 | 29/3 |
| Pascall (J.): 8% Preferred | 10/7 | £1 | 10/2 |
| Peak Frean: 5% Pref. | 17/- | £1 | 17/9 |
| 8% "A" Pref. | 25/6 | £1 | 26/6 |
| Radcliffs Edible: Ord. | 2/7 | 1/- | 2/6 |
| 8% Pref. | 9/6 | 10/ | 9/9 |
| Radiation: Ord. | 39/3 | £1 | 38/6 |
| 6% Pref. | 21/10 | £1 | 21/3 |
| Scribbans: Ord. | 13/- | £1 | 12/3 |
| Deferred | 1/10 | 1/- | 1/9 |
| Schweppes: Deferred | 36/- | £1 | 36/3 |
| 4% Deb. | 75 | £100 | 75 |
| Smith's Potato Crisps: Ord. | 8/9 | 5/- | 9/6 |
| Spiers and Pond: Ord. | 18/9 | 10/- | 18/10 |
| 6½% Pref. | 20/5 | £1 | 20/6 |
| 5% Deb. | 95 | £100 | 94 |
| Spillers: Ord. | 19/5 | £1 | 23/6 |
| 6% Pref. | 18/6 | £1 | 19/2 |
| Deferred | 6/4 | £1 | 7/6 |
| Tate and Lyle: Ord. | 41/6 | £1 | 40/- |
| 6½% Pref. | 22/7 | £1 | 22/3 |
| Unilever: Ord. | 62/3 | £1 | 74/- |
| 7% Preferred | 23/5 | £1 | 23/- |
| Union Cold Storage: 6% Pref. | 19/10 | £1 | 19/9 |
| 7% Pref. | 21/3 | £1 | 21/9 |
| 10% Pref. | 25/7 | £1 | 25/7 |

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## Fruit and Vegetable Products

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202. Pectin Jellies. G. Spencer. (*J. Phys. Chem.*, 1929, p. 1987.)
203. Apples for Pies. L. C. Mazzola. (*Food Inds.*, 1930, p. 111.)
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## Cereal Products

206. Estimation of Moisture in Flour. M. Blish and B. Hites. (*Cer. Chem.*, 1930, March, p. 99.)
207. Water Imbibition of Frosted Wheat. C. H. Bailey and E. Bayfield. (*Ibid.*, p. 108.)
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209. Yeast Testing. W. Cook and J. Malloch. (*Ibid.*, p. 133.)
210. Certain Effects of Varying the pH of the Tempering Water upon the Wheat Proteins. M. Markley. (*Ibid.*, p. 154.)
211. Determination of Ash. E. Klopfstein. (*Ibid.*, p. 159.)
212. Determination of Protein of Wheat. H. Wilkins. (*Ibid.*, p. 168.)
213. Effect of Severe Weathering on Protein and Ash Contents of Wheat and Flour. W. Whitcomb and A. Johnson. (*Ibid.*, p. 162.)
214. Colour Reactions of Proteins of Wheat Corn. E. Rabaté and J. Fleckinger. (*Compt. rend.*, 1930, p. 748.)
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217. Bleaching of Flour. C. Schweizer. (*Mitt. Geb. Lebensm. Hyg.*, 1928, p. 223.)
218. Addition of Chemicals to Flour to Increase Volume on Baking. H. Kalning. (*Chem., Ztg.*, 1930, p. 161.)
219. Some Properties of Wheat Flours. E. Cazaubon. (*Bull. Assoc. Chim. Sucr.*, 1930, p. 44.)
220. Change in Acidity of Bread on Storage. L. Karácsonyi. (*Magyar Chem. Fol.*, 1929, p. 22.)

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222. Biochemistry of Cheese Ripening. C. Barthel. (*Svensk. Kem. Tidskr.*, 1930, p. 28.)
223. Detection of Adulteration in Milk. Szelinski. (*Chem. Ztg.*, 1930, p. 173.)
224. Butter Fat Losses in Buttermilk. W. Udy. (*N.Z. J. Sci. Tech.*, 1929, p. 249.)
225. Seasonal Variation in Vitamin Content of New Zealand Butter. J. Malcom and E. Pope. (*Ibid.*, p. 228.)
226. Enzyme Activity of Ice-Cream Improvers. P. Tracy and H. Ruehe. (*Univ. Ill. Agri. Exp. Sta.*, Bull. No. 333, 1929, p. 483.)
227. Influence of Rennin on Ripening of Cheese. J. Hawesson. (*Lait.*, 1929, pp. 2, 148, 358, 500.)

## Analysis

228. Determination of Minute Amounts of Lead and Copper in Food, Beverages, etc. (*Analyst*, 1930, May, p. 323.)
229. Pollen Analysis of Honey. C. Briebel. (*Z. Unters. Lebensm.*, 1930, p. 63.)
230. Detection of Fruit Wine in Grape Wine. G. Reif. (*Ibid.*, p. 99.)
231. Arachidonic Acid in Lard. J. Brown and E. Deck. (*J. Am. Chem. Soc.*, 1930, p. 1135.)
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236. Comparative Sucrose Determinations in Sweetened Condensed Milk. A. Düring. (*Pharm. Zentr.*, 1930, p. 49.)
237. Margarine Containing Egg-Yolk. E. Vorhase, etc. (*Z. Unters. Lebensm.*, 1929, p. 342.)
238. Purification and Determination of Pectin. G. Spencer. (*J. Phys. Chem.*, 1930, p. 429.)
239. Determination of Vanillin. L. V. Towt. (*J. Dairy Sci.*, 1929, p. 469.)
240. Determination of Butter Fat in Ice-Cream. E. Chase and F. King. (*J. Dairy Sci.*, 1929, p. 473.)
241. Separation of Maize Starch from Egg Powder. Comte. (*Ann. Falsif.*, 1929, p. 600.)
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243. Diastase in Honey. G. Vansell. (*J. Econ. Entomol.*, 1929, p. 926.)
244. Examination of Honey and Honey Cakes. C. Kruisheer. (*Z. Unters. Lebensm*, 1929, p. 282.)
245. Determination of Traces of Iodine. J. McClendon, etc. (*J. Am. Chem. Soc.*, 1930, p. 541.)
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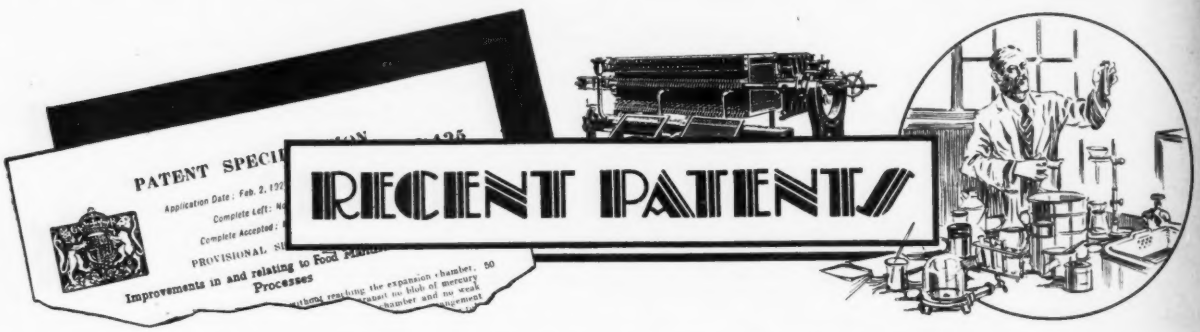


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## Latest Patent Applications

14237. HALL, P.: Treatment of yeast, etc. May 8.

14031. MAPLETON, H., AND MAPLETON'S NUT FOOD CO., LTD.: Blanching-nuts, etc. May 7.

14303. BROOKS, H.: Sweetmeat. May 1.

13303. LANGFELDT, E.: Manufacture of butter, etc. April 30.

12654. WHITTAKER, A.: Manufacture of sweetmeats. April 24.

## Specifications Published

328,607. GUGGENHEIM, M. M., BAKER, G. R., BAKER PERKINS, LTD., AND ANCIENS ETABLISSEMENTS A. SAVY, JEANJEAN, ET CIE., SOC. ANON.: Confectionery.

328,318. LYONS AND CO., LTD., J., AND GRANVILLE, D. A.: Preparation of sweetmeat and like substances.

317,309. SIMONDS DEVICES CO., E. M.: Apparatus for cooking food.

328,075. BOLLMANN, H., AND REWALD, DR. B.: Production of bakery goods, pastries, confectionery, and the like.

300,261. KELLOGG, CO.: Production of puffed, popped, or expanded cereal food products.

327,701. EPSTEIN, A. K.: Egg products, and processes for producing same.

*Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2., at the uniform price of 1s. each.*

## Abstracts Published

326,849. **Canning sausages.** MODERN FOOD PROCESS CO., 30th Street, Philadelphia, U.S.A.

*Preserving sausages.*—A process of canning sausages, described particularly with reference to the canning of sausages having a natural casing formed by treating the meat mixture of the sausage by the process described in Specification 326,847, consists in forming the sausages into a predetermined shape, of substantially uniform diameter and length, packing them tightly into containers to minimise the unfilled space, filling the spaces between the sausages with a liquid such as hot brine, sealing the containers and then heating the sealed containers to sterilise the contents. The final heating is carried out at a temperature between 230° F. and 240° F., or higher, for about fifteen to thirty minutes. The heated containers are then suddenly chilled.

326,772. **Food preparations.** POTT, F. M., 33, Princess Street, Cornbrook, Manchester.

For making food stuffing having shredded suet as an ingredient, finely shredded suet is treated with rice or other farinaceous flour, the other ingredients are comminuted, the treated suet and the comminuted other ingredients are fed separately through a drying-chamber, preferably cone-shaped, through which a current of warm air is forced, and the dried products are then mixed in the required proportions. The other ingredients may comprise, for example, granulated onion, a dried seasoning herb, such as sage, and salt and pepper. The Provisional Specification states that the ingredients may be reduced either before or after being passed through the drying chamber. It also refers to stuffings which may not include suet; for example, a pork or goose stuffing comprising dried and powdered bread mixed with dried and granulated onion, a dried herb, such as sage, and pepper and salt, suet being added or not.

326,742. **Margarine.** (VAN DEN BERGH'S MARGARINE GES., Cleve, Rhineland, Germany).

In the manufacture of vitamin-containing margarine from vegetable fats the vitamin-containing extract is emulsified with vegetable mucilage or vegetable gums before addition to the margarine mass. The vitamin extract, obtained, for example, from rice husks, green malt, cereals, carrots, or yeast, by extraction with water and/or alcohol and then evaporation under vacuum at low temperature, may be emulsified with aqueous extract or carragheen, agar, gum arabic, etc., with or without egg yolk or dried egg yolk with a small quantity of alkali carbonate, and the emulsion thus formed is added to the mass in the churn or during the rolling of the churned and cooled mass. When the emulsion is added the temperature should not exceed about 40° C. Specification 207,545 is referred to.